BIG DRY

ENVIRONMENTAL IMPACT STATEMENT
VEGETATION ALLOCATION

FEBRUARY 1982

DRAFT

UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
MILES CITY DISTRICT

IN REPLY REFER TO

United States Department of the Interior

BUREAU OF LAND MANAGEMENT
222 North 32nd Street
P.O. Box 30157
Billings, Montana 59107

Dear Reader:

The Big Dry Vegetation Allocation Draft Environmental Impact Statement is presented for your review and comment. The document describes vegetation allocations and recommended grazing management programs for 1.18 million acres of public lands administered by the Bureau of Land Management in the Big Dry Resource Area of the Miles City District. A preferred alternative and three other alternatives are presented for consideration. The four possible alternatives are described briefly in the abstract in the front of the document and more completely in Chapter 2. The environmental consequences of each alternative are considered in Chapter 4.

Written comments from interested citizens and public agencies will be accepted until March 26, 1982. Comments should be sent to Ray Brubaker, District Manager, District Office, BLM, P.O. Box 940, Miles City, Montana 59301.

After the comments received have been reviewed, a final environmental impact statement will be prepared. Unless the changes are extensive, the final statement may consist of only the comments, responses to the comments and errata sheets to update information contained in the draft document; therefore, interested parties should retain their copies of the draft EIS.

Hearings for public comment have been scheduled as follows:

Forsyth, Montana — March 1, 1982, 8:00 p.m. at the Rosebud County Library
Terry, Montana — March 2, 1982, 8:00 p.m. at the Prairie County Grazing District Office
Baker, Montana — March 3, 1982, 8:00 p.m. at the Fallon County Library

Testimony received through written comments or at the public hearings will be considered during preparation of the final environmental impact statement. No decision on the preferred vegetation allocation and grazing management program will be made until the final environmental impact statement is completed.

Sincerely yours,

Michael J. Penfold

Michael J. Penfold
State Director

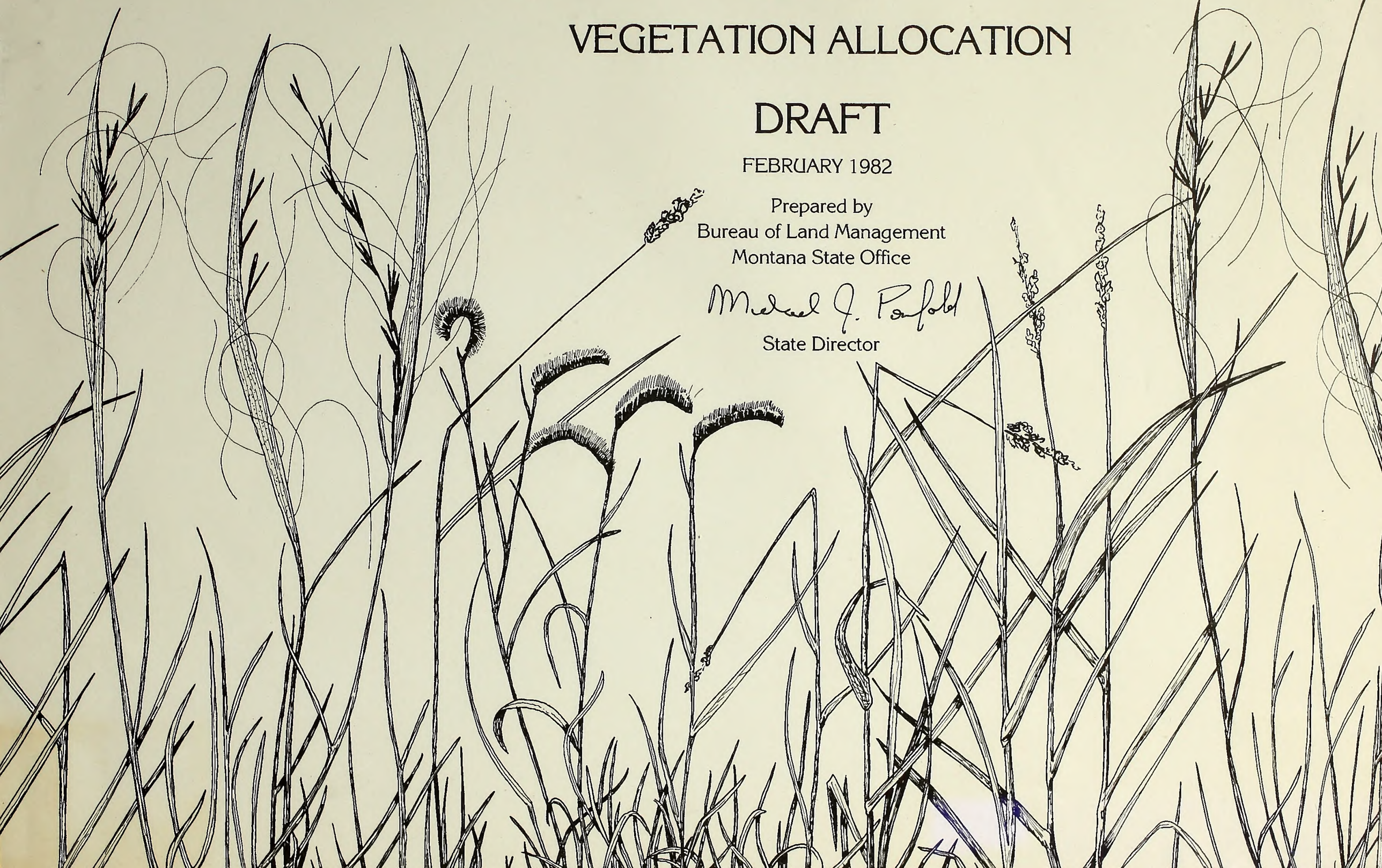
Department of the Interior
Environmental Impact Statement

BIG DRY
VEGETATION ALLOCATION
DRAFT

FEBRUARY 1982

Prepared by
Bureau of Land Management
Montana State Office

Michael J. Penfold
State Director



UNITED STATES DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

BIG DRY VEGETATION ALLOCATION
DRAFT ENVIRONMENTAL IMPACT STATEMENT

PORTIONS OF GARFIELD, ROSEBUD, McCONE, CUSTER, AND CARTER COUNTIES AND ALL OF DAWSON, FALLON, PRAIRIE, RICHLAND, AND WIBAUX COUNTIES IN MONTANA

This Draft Environmental Impact Statement (DEIS) discusses proposed vegetation allocations for about one million acres of public lands (of which 85% are in good to excellent condition) administered by the Bureau of Land Management in the Miles City District. Four alternative courses of action, including a preferred alternative, have been analyzed. Final vegetation allocations and management action will be decided from these alternatives. The environmental consequences of each alternative have been analyzed for both the period of implementation, between 1983 and 1988, and for the long term, the 15 years following implementation.

Alternative A, "Continued Development for Optimum Range Utilization," would have the management goal of keeping livestock and other uses in line with the estimated grazing capacity through continuation of rangeland improvements, grazing systems and monitoring programs. Thirty existing AMPs would be revised and 63 new AMPs would be implemented to bring 49% of the less than good land into good or better range condition. The remaining 51% (47,830 acres) of less than good lands are in holdings considered unsuitable for proper management. These small holdings are scattered among the remaining 684 permittees. This alternative would continue the present management system with only minimal increases resulting from improvement of the few areas presently in less than good condition.

Allocations to both livestock and wildlife and other uses would increase in the long term due to improved ecological range condition. This is the BLM's preferred alternative.

Alternative B, "Enhanced Watershed Value and Wildlife Habitat," would reallocate 19% of the vegetation from livestock to nonconsumptive and wildlife uses, and would continue the 30 existing Animal Management Plans (AMPs) and implement 63 new AMPs. Range condition would be maintained or improved. Vegetation condition would improve on riparian areas around reservoirs, on floodplains and on erosion-susceptible areas. Wildlife habitat would improve. Rancher income would decrease, but total area earnings would increase in the short term.

Alternative C, "No Grazing," would eliminate livestock grazing on public land. No range improvements would be built or maintained unless deemed necessary for protection of watershed or wildlife resources. Ecological range condition of most rangelands would improve in the short term. Wildlife habitat would improve initially but would be negatively affected in the long term.

Rancher income would decline. Construction of 7,400 miles of fence would be necessary to implement this alternative.

Alternative D, "No Action," would freeze the current range program of 30 AMPs with continuation of current range allocations and no new range improvements being constructed. Ecological range and watershed condition would decline in the long term. Wildlife habitat would remain static or be reduced in quality. Fishery reservoirs would be adversely affected by accelerated sedimentation. Long term ranch income and employment would likely decline from decreased forage production.

Of the alternatives, Alternative C would have the greatest implementation cost while regional income would likely increase only in Alternatives A and B. Range condition would improve under Alternatives A and B, but would be adversely affected or decline in the long term under Alternative D. Under Alternative C range condition would improve to a near climax stage and then level off and stagnate on most soils in the long term.

Components of the four alternatives are presented for public review in this DEIS. The document is the text and map supplement. The location of the DEIS study area within the state is shown on Map 1-1 in Chapter 1.

For further information, contact Ray Brubaker, District Manager, Miles City District Office, Bureau of Land Management, P.O. Box 940, Miles City, Montana 59301 or phone (406) 232-4331.

FEBRUARY 1982

SUMMARY

The Big Dry Draft Environmental Impact Statement (DEIS) includes the Bureau of Land Management's (BLM) northern division of the Miles City District, the Big Dry Resource Area. The total area of the Big Dry is around 10.8 million acres, encompassing all or parts of 10 eastern Montana counties. This area contains about 1.18 million acres of public lands administered by the BLM.

Soil and vegetation inventories, water resource surveys, social and economic surveys and other resource inventories were begun in 1977 and completed in 1981. Throughout the resource inventory and survey process, the public was asked to suggest issues and concerns on the use of public lands.

Public participation in BLM's planning process was solicited through individual interviews in the EIS area, newspaper articles and the mailing of more than 2,600 brochures to livestock operators using public lands, residents and interested groups in the area. About 40 comments were received as a result of this brochure. In addition, open house sessions were held in Terry and Baker, Montana March 23-24, 1981, to solicit responses from the public. A list of agencies and organizations consulted or commenting on public land issues can be found in Chapter 5.

Based on resource inventories, issues raised by the public and procedural requirements, four alternative courses of acton were developed. Alternative A, "Continued Development for Optimum Range Utilization," was selected as the preferred alternative because of the resource benefits, cost and public comment. After reviewing the draft EIS, decision-makers will select the final range-land management program to be implemented on public lands in the Big Dry EIS area. This management program may be the preferred alternative or it may incorporate parts of all alternatives.

Major concerns raised by the public were:

Livestock production, wildlife numbers and water development. Local residents expressed concerns relating to the control of undesirable plant species, control of prairie dogs and making more water available for livestock.

Wildlife concerns of the public included balancing wildlife and livestock use and maintaining and improving wildlife habitat. Other public concerns centered on the protection of watershed and soil resources. Many people felt that things should be left as they are because long time resource conservation practices in effect over the years have maintained or improved resource conditions overall on both private and public lands. BLM resource specialists raised issues almost parallel to those of the public. Major concerns brought forth both by the public and by BLM specialists are considered in this DEIS.

The major livestock issue is the need to maintain or improve ecological range condition. Of the 1,178,777 acres of public lands in the EIS area, 2,223 acres are in poor ecological range condition, 93,268 acres are in fair condition, 1,004,061 acres are in good to excellent ecological range condition; and 19,254 acres are unclassified as to condition. An additional 59,971 acres are classed as tame pasture.

In this DEIS, the four alternatives from which the final grazing management program will be selected are titled: (A) Continued Development for Optimum Range Utilization, (B) Enhanced Watershed Value and Wildlife Habitat, (C) No Grazing and (D) No Action.

These alternatives were developed from information and recommendations in the Redwater, New Prairie, and Jordan-North Rosebud Management Framework Plans (MFPs). Recommendations from the Step II MFP provided the basis for Alternative A. Recommendations from Step I wildlife and watershed were used to develop the basis for Alternative B. Alternative D assumes a "freeze" on developments and use of existing information and projections without further development. Alternative C assumes total removal of livestock and projects range conditions without domestic grazing.

Proposals in Alternatives A and B would reduce the amount of range in poor and fair ecological range condition. Alternatives A and B increase the forage allocation to livestock in the long term.

Initial livestock animal unit months (AUMs) would remain the same in Alternatives A and D, decrease by 19 percent in Alternative B and decrease to zero in Alternative C. In the long term (15 years after implementation), Alternative C would result in no livestock AUMs; Alternative D would not change livstock AUMs and Alternatives A and B would increase the livestock AUMs above the short term projections. The preferred alternative would increase livestock forage by six percent, because of the implementation of mechanical and grazing treatments and the development of range facilities.

Both the public and BLM are concerned with maintaining adequate wildlife habitat while maintaining a balance between livestock and wildlife use.

Protecting soil by reducing erosion is another major concern of both the public and BLM resource specialists. Increasing vegetation cover through mechanical or grazing treatments would improve the capacity of the soil to absorb the water necessary for vegetation production. Increased absorption of moisture into the soil reduces runoff, erosion and maintains soil productivity. High levels of vegetation production would increase the amount of forage for both livestock and wildlife use. Other watershed concerns include limiting early season livestock use on wet soils in riparian zones to reduce soil compaction.

A summary of the environmental consequences for each of the four alternatives follows.

Alternative A: Continued Development for Optimum Range Utilization

As the preferred alternative, this proposes revision while continuing operation of the 30 existing AMPs on 227,776 acres of public lands, implementation of 63 new AMPs on 294,798 acres and continued permitted grazing on 684 allotments, 651,781 acres, not proposed for AMP implementation.

Watershed condition would improve in the long term, with a reduction of sediment and water yields by approximately 20% and 18%, respectively.

Ecological range condition would be maintained or improved to good to excellent condition on most lands with a vegetation production increase of 54.5 million pounds. The vegetation allocations to livestock and wildlife would increase by six percent in the long term.

Wildlife habitat would improve with special consideration given to protect crucial wildlife habitat and wintering areas. Prairie dog control would be evaluated on a case-by-case basis in accordance with the statewide prairie dog management policy.

Improved watershed and ecological range condition would reduce the natural destruction of some cultural resource sites by erosion. Long term loss of scientific data could occur if sites were destroyed by ground disturbances resulting from implementation of range projects and land treatments. However, most range improvements would be located to avoid cultural sites.

Implementaton of this alternative would result in an increase of $205,638 in annual total income on 350 ranch operations. Total permit values would increase by $1,703,000, or 7% of the present total, in the long term. Social impacts to the ranching community would be positive in the short and long term.

Regional earnings would increase by $1,635,000 annually and employment would increase by 134 persons in the short term. There are no long term changes in either category.

Total implementation cost of this alternative would be $11,955,751.

Alternative B: Enhanced Watershed Value and Wildlife Habitat

This alternative proposes continuing the 30 existing AMPs, implementation of 63 new AMPs and continue permitted grazing on 684 allotments unsuitable for AMP implementation.

Watershed condition would improve in the long term, with a reduction of sediment and water yields by approximately 28% and 23% respectively.

Range condition would be maintained or improved to good or excellent condition on most lands. Vegetation condition would improve in riparian areas, around reservoirs, on floodplains and erosion-susceptible areas. Livestock allocations would be reduced by 48,674 AUMs in the short term due to the reallocation of AUMs to nonconsumptive uses and wildlife. In the long term there would be a 7% increase of AUMs to livestock and a 6% increase to nonconsumptive uses and wildlife beyond the short term projections.

Wildlife habitat would improve for big game, upland game and waterfowl as would nongame habitat and 33 additional fisheries reservoirs are proposed.

Improved watershed and ecological range condition would reduce the natural destruction of some cultural resource sites by erosion. Long term loss of scientific data could occur if sites were destroyed by ground disturbances resulting from implementation of range projects and land treatments. However, most range improvements would be located to avoid cultural sites.

This alternative would result in a short term annual decrease of $544,306 on 418 ranch operations. Long term annual decreases would be $481,435 on 335 operations and long term annual increases would be $90,938 on 176 operations. Total permit values would decrease by $4,866,000 in the short term and $3,264,000 in the long term.

Ranchers' attitudes toward BLM would be negative due to decreased forage allocation to livestock. Recreationist and environmentalist attitudes would be positive due to increased wildlife habitat and reduced livestock conflicts.

Total earnings would increase by $1,358,000 annually in the short term due mostly to increased construction, and decrease by $231,000 annually in the long term. Total employment would increase by 106 people in the short term and decrease by 23 persons in the long term.

Total implementation cost of this alternative would be $15,476,551.

Alternative C: No Grazing

This alternative would eliminate livestock grazing on public lands affecting 777 allotments. No range improvements would be built or maintained unless the improvements were considered necessary for watershed or wildlife resources.

Watershed conditions would improve with a reduction of sediment and water yield by 54% and 30%, respectively.

Ecological range condition of most rangelands would improve while areas occupied by prairie dogs would decline or become poor. Noxious weeds would be controlled when threatening to private lands.

Wildlife habitat would improve initially, but would trend toward a climax vegetation which is a less desirable habitat. Prairie dog control would be necessary to protect private lands and crucial wildlife habitat affected by expansions of existing towns.

In short and long term, income would decrease on 608 operations (see Appendix 3.9). The decrease in net income would be 24% of the current total.

Rancher attitudes would be extremely negative toward this alternative.

Total earnings would decrease $501,000 annually in the short term and $3,009,000 annually in the long term. Total employment would have a net decrease of 60 people in the short term and 303 people in the long term.

Total implementation of this alternative would be $16,944,100 (the cost to the private landowners to fence off public land with approximately 7,400 miles of fence).

Alternative D: No Action

This alternative would freeze the current range program of 30 AMPS. Vegetation allocations would remain the same, regardless of range condition. AMPs in effect would continue, but no new range improvements would be developed. Maintenance of current improvements would be allowed.

Watershed condition would decline with an increase in sediment and water yields of 15% and 12%, respectively.

Ecological range condition would decline in the long term. Production would also decline in the long term due to the spread of prairie dogs, noxious weeds and lack of responsive grazing management.

Wildlife habitat would remain static or be reduced in quality with the lack of rest or deferment grazing treatments. Prairie dog towns would be allowed to expand. Some existing fisheries reservoirs would be lost as viable fisheries because of accelerated sedimentation.

No changes in ranch income and employment can be quantified in this alternative. However, reductions in both are likely in the long term as livestock forage production decreases.

Rancher attitudes toward this alternative would be negative because of a deteriorating range condition and less opportunity for income gain.

There would be no implementation cost for this alternative as maintenance to fences would be the responsibility of the operator and by 1984, maintenance cost of reservoirs, springs, etc., would also be their responsibility.[1]

[1]BLM Range Improvement Policy, 1981

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CHAPTER 1

PURPOSE AND NEED

INTRODUCTION

The Big Dry Environmental Impact Statement (EIS) analyzes the resource, social and economic impacts of instituting a rangeland management program in the northern portion of the Miles City District of the Bureau of Land Management (BLM) in Montana.

The BLM is responsible for the management of livestock grazing on public lands in a manner that maintains or improves the public land resources including soil, water, vegetation, and wildlife habitat. The Bureau's principal authority to manage public lands is found in the Taylor Grazing Act of 1934, Federal Land Policy and Management Act of 1976, and the Public Rangelands Improvement Act of 1978.

BASIS

This EIS is written in compliance with the National Environmental Policy Act of 1969, Council on Environmental Quality regulations, and in specific response to litigation in the Natural Resources Defense Council et al versus Rogers C. B. Morton et al. 1973 (U.S. District Court for the District of Columbia, ref. Case No. 1983-73).

The proposed action is to develop a livestock grazing program consisting of vegetation allocation necessary to equitably allocate the vegetation among competing consumptive and nonconsumptive uses, and implementation of grazing systems and range improvement projects to maintain or improve vegetation yields and watershed conditions. The purpose of the proposed action is to implement decisions needed for management, protection, and enhancement of the rangeland resources. The proposal would cover a 15-year period from the time actions are implemented.

SETTING

The planning area selected for the Big Dry EIS consists of all public lands in the Big Dry Resource Area in the Miles City District lying to the south and east of those lands analyzed in the Missouri Breaks EIS. (See Map 1, Map Supplement.) Involved are all or portions of Garfield, McCone, Richland, Dawson, Rosebud, Prairie, Custer, Fallon, Wibaux and Carter Counties.

The Big Dry EIS effort relates to the vegetation allocation capability of an estimated 1.18 million acres of public lands, potential impacts which can be anticipated from the allocation process, plus all reasonable alternatives surfaced during the process. Map 1-1 shows the resource area and planning units. Table 1-1 is a summary of the Big Dry land status. The major drainages include the Missouri, Yellowstone, Powder and Musselshell Rivers.

The Big Dry EIS area of eastern Montana (Map 1-1) is characterized by rolling prairies, broken by drainages which are sometimes sharply incised to include river breaks landforms. Population in the area is mainly concentrated in the Yellowstone River Valley. Many of the ranch operations are remote from the river valley towns.

Total acreage in the ten-county EIS area is approximately 10.8 million acres, including 1.18 million acres of public lands under BLM management (see Map 1, Map Supplement). Most of the public lands are concentrated in Prairie and Fallon Counties and include substantial amounts of land utilization (LU) lands reacquired by the government under the Bankhead-Jones Act of 1937.

The EIS area includes a total of 777 allotments involving ranch operations. Many of these include some grain and hay farming in combination with livestock production. There are three cooperative state grazing districts and two grazing associations in the EIS area. There are 1,178,777 acres of public lands that are allotted to livestock grazing (Map 2, Map Supplement). These lands are administered through the Big Dry Resource Area Office of the Miles City District.

While there are a few large contiguous tracts of public land, the primary land ownership pattern consists of scattered tracts of public lands intermingled with private and state lands. These land patterns strongly affect grazing management options. Private lands are usually located along drainage bottoms and on the more productive uplands. In addition to livestock grazing, public lands provide wildlife habitat, recreation, and other activities

TABLE 1-1
BIG DRY LAND SUMMARY

MANAGEMENT FRAMEWORK PLAN (MFP)*	BLM ADMIN. SURFACE ACRES	PERCENT OF TOTAL ACREAGE	OTHER SURFACE	TOTAL SURFACE
Redwater	181,800	4.0	4,381,200	4,563,000
Jordan - No. Rosebud	252,100	7.8	2,976,400	3,228,500
New Prairie	709,150	23.4	2,323,220	3,032,370

*These acreage figures do not agree with those in Table 1-2 because allotments cross planning unit, planning area and EIS area boundaries.

compatible with multiple resource management.

Table 1-2 summarizes the land ownership and administrative responsibility for federal land surface in the EIS area.

TABLE 1-2
LAND OWNERSHIP IN THE BIG DRY EIS AREA

	Acres	Percent of Total
Federal (BLM Administered)	1,172,724	10.2
*Federal (Bureau of Reclamation)	52,834	0.5
Federal (USFWS—Lame Steer National Wildlife Refuge)	1,411	0.01
Federal (USDA Ft. Keogh Agri. Exper. Station)	9,843	0.09
Private	9,567,497	83.3
State	675,046[1]	5.9
TOTAL	11,479,355	

[1]Includes State Fish & Wildlife lands

*NOTE: Bureau of Reclamation withdrawals encompass private lands, most of which have been patented after the withdrawal went into effect. These withdrawals still remain on the books, however.

MANAGEMENT GUIDANCE AND RESOURCE COORDINATION

The administration of public lands involves the complex interdependence among lands of different ownership, uses and capabilities. The EIS area contains private lands as well as lands managed by the Montana Department of State Lands, and the Montana Department of Fish, Wildlife and Parks.

Development of the proposed rangeland management program is guided by mandates to manage the public lands for multiple use and sustained yield under the Federal Land Policy Management Act (FLPMA) of 1976 (90 Stat. 2743). The system begins with land use planning. This involves multidisciplinary resource inventories contained in the Unit Resource Analysis (URA) and social and economic data analyzed in the Planning Area Analysis (PAA). Management decisions are then developed in the Management Framework Plan (MFP). MFP Step II recommendations provided the basis for Alternative A and MFP Step I recommendations provided the basis for Alternative B. Alternative C assumes no livestock grazing and Alternative D is based upon the present grazing management system and vegetation allocations.

The EIS area includes the Redwater, New Prairie, and Jordan-North Rosebud planning areas. The Redwater MFP was completed in September 1979. The Jordan-North Rosebud and New Prairie MFPs were completed through Step 2 (Multiple Use Recommendations) in December 1981. Step 3 decisions will be made following completion of this EIS. Some revisions of the Redwater MFP may be required, depending on EIS results.

These planning documents are on file at the Miles City BLM District Office.

Following the EIS, individual allotment management plans (AMPs) will be prepared. The analysis developed in the EIS will help guide AMP development. The full range of Soil Vegetation Inventory Method (SVIM) data will also then be available to help select the proper grazing systems, treatments, range improvements, and grazing adjustments to implement individual AMPs.

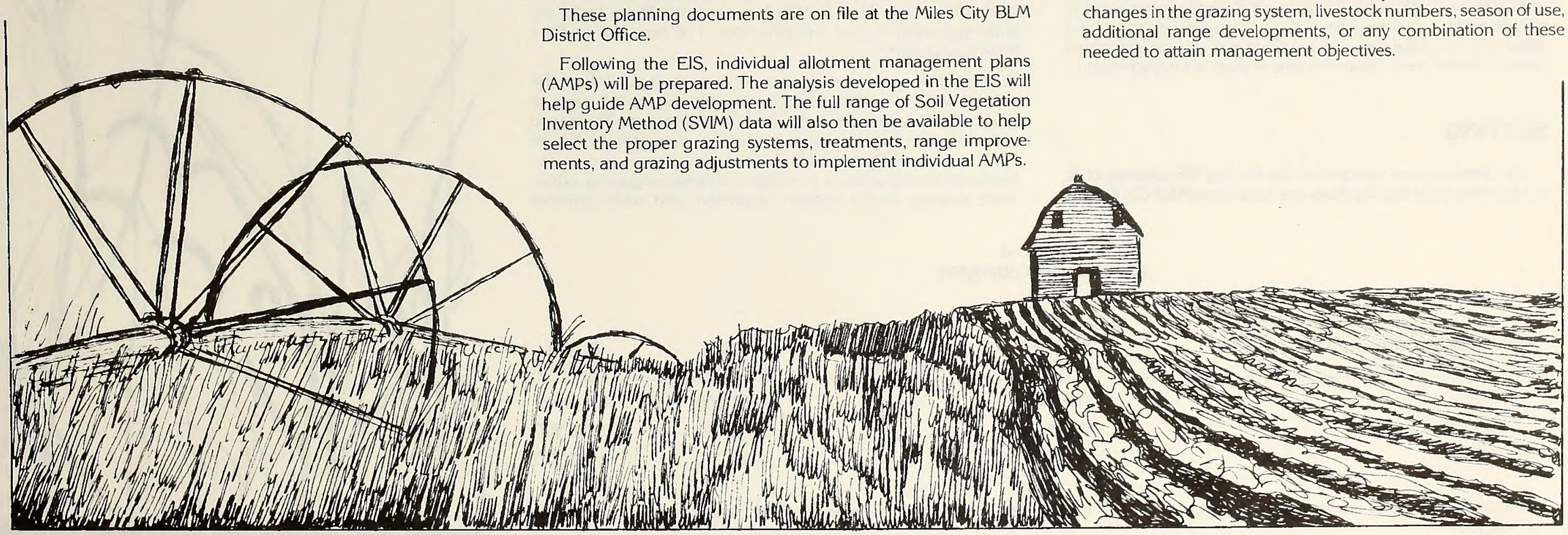
MONITORING AND EVALUATION OF AMPS

The key to success of any grazing management plan is a system of monitoring and evaluation that ensures the stated objectives are being met.Each allotment has different potentials, opportunities, problems, and objectives. The AMP may involve various levels of management intensity, including only documentation of present management. The monitoring and evaluation plan, therefore, must be flexible, cost effective, and tailored to the needs of the allotments. The basic monitoring and evaluation plan outline (or matrix) for the Big Dry EIS area is included as Table 1-3.

Typical monitoring activities include regular visits (preferably with the ranch operator) to observe how the system is operating and to resolve any problems. This involves checking utilization levels in each pasture, collecting actual use information, and conducting any other necessary studies. These studies may include wildlife habitat, riparian vegetation, aquatic habitat, and water quality.

Allotment evaluation will normally be conducted at longer intervals than monitoring activities (which are a part of evaluation) and will measure changes in range condition, vegetation cover, litter, community age structure, plant vigor, and watershed condition. Various trend study methods would be employed to document trend in key areas. Comparison of vegetation production on comparable sites must be normalized to account for precipitation and soil series differences.

The AMPs will be revised as necessary. Revisions may include changes in the grazing system, livestock numbers, season of use, additional range developments, or any combination of these needed to attain management objectives.



MAP 1-1. LOCATION OF BIG DRY EIS AREA

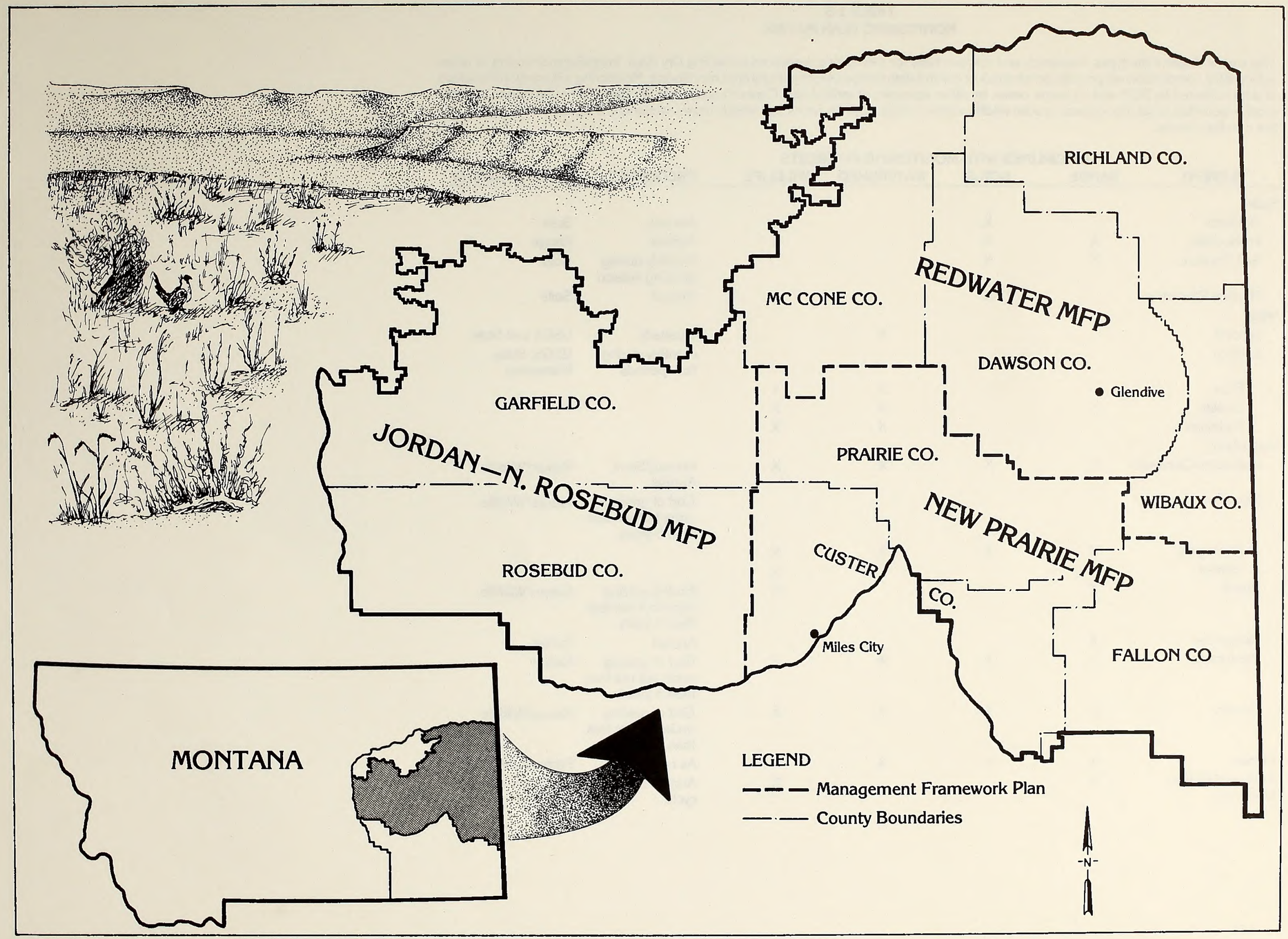


TABLE 1-3
MONITORING PLAN MATRIX

This matrix displays the types, frequency and responsibility for monitoring resources in the Big Dry Area. Intensive monitoring of areas selected for comparison will provide bench mark or control data for specific or general area monitoring. Monitoring will consist of analysis of data collected by BLM and, in some cases, by other agencies or individuals. Concern areas include (but are not limited to): severe erosion potential areas, floodplains, crucial wildlife winter ranges, riparian zones and woody draws, wetland and aquatic areas, AMPs and low condition areas.

	DISCIPLINES WITH MONITORING INTERESTS					
ELEMENT	RANGE	SOILS	WATERSHED	WILDLIFE	FREQUENCY	RESPONSIBILITY
Soils						
Nutrients		X			Annual	Soils
Productivity	X	X		X	Annual	Range
Soil Moisture	X	X			Monthly during growing season	Soils
Physical Properties		X			Annual	Soils
Water						
Ground			X		Quarterly	USGS and State
Surface					Monthly during flow periods	USGS, State, Watershed
Flow			X	X		
Quality	X		X	X		
Sediment			X	X		
Vegetation						
Utilization/Carryover	X	X	X	X	Annual/Semi Annual	Range/Wildlife
Condition					End of grazing cycle but not less than 5 years	Range/Wildlife
Ecological	X	X	X	X		
Habitat	X			X		
Trend	X			X	End of grazing cycle but not less than 5 years	Range/Wildlife
Actual Use	X				Annual	Range
Productivity	X	X	X	X	End of grazing cycle but not less than 5 years	Range
Density	X	X	X	X	End of grazing cycle but not less than 5 years	Range/Wildlife
Climate	X	X	X	X	As needed	Primarily NOAA
Animals (Wildlife, Livestock)	X			X	Annual & 3 year cycle	Operators and MTDFWP

CHAPTER 2

THE ALTERNATIVES

VEGETATION ALLOCATION ALTERNATIVES AND THE PREFERRED ALTERNATIVE

The alternatives are described in both the short and long term. The short term is a five-year implementation period during which most proposed actions would take place. An exception to this time frame would be the proposed land treatments. Before these treatments are implemented, grazing systems may need to be carried out for a longer period to determine if further treatment is needed. All responses to range developments would be assumed to take place in the long term, the 15 years after implementation of an action.

Long term vegetation allocations would be 25 percent to livestock and 75 percent to nonconsumptive and wildlife uses in the first two alternatives discussed. Allocations for nonconsumptive vegetation uses exceed the amount of vegetation removed by consumptive use in all alternatives.

Due to the limited data on vegetation and production, several assumptions have been made in computing allocation levels for the various alternatives. Since these assumptions are based on professional judgment and current ecological range condition information in the EIS area, it is believed that the allocations are valid. However, until the validity of the allocations can be verified by BLM approved field surveys and studies on allotments, they will be considered as "target allocations." See Appendix 2.3 for the descriptions of the computations made to arrive at the allocations to be found in Appendix 2.4. Assumptions made in the computations for current vegetation allocations are as follows:

1. Livestock licensed use during 1981 was 98.5 percent (249,279 of 253,075 AUMs which is 25% of the total vegetation base) of the vegetation allocated to livestock.

2. Wildlife utilize about 5 percent (35,204 AUMs) of the vegetation allocated to nonconsumptive and wildlife uses (3 percent of the total vegetation based on Montana Department of Fish, Wildlife and Parks population estimates valid only for the summer of 1980). BLM biologists and range conservationists and Montana State FWP personnel agree that the present wildlife (big game) populations in the EIS area are generally provided for adequately under current allocations. Exceptions are local situations that would be accounted for in the development of AMPs.

3. With proper consumptive use assumed, vegetation reserved for range maintenance and watershed protection is 50 percent (506,170 AUMs).

Cost estimates for each alternative are made with the understanding that any proposed range development will be modified or reduced in scale to avoid cultural sites that would require major excavation.

Table 2-1 shows a summary of data for each of the four alternatives.

Alternative A: Continued Development for Optimum Range Utilization

This has been selected as the preferred alternative because of two factors. Analysis of the alternative by the District and Area Managers shows that the management goal of bringing livestock and other uses into line with the estimated grazing capacity, as outlined by the MFP Step II recommendations, can be reached through rangeland improvements, grazing systems and monitoring programs.

Secondly, public response received during the scoping process revealed a strong desire for continuing management near its present level with only minimal increases, targeting only areas in less than good condition for improvement.

This alternative proposes optimum range utilization. Emphasis for improvement is placed on areas identified as being in less than good range condition. The present management program currently provides 253,075 AUMs to 777 allotments for grazing uses and 759,255 AUMs to nonconsumptive and wildlife uses. Long term allocations, due to increased vegetation production through grazing systems and various land treatments, will be 270,115 AUMs to livestock and 810,345 AUMs to nonconsumptive and wildlife uses (Table 2-2). These vegetative increases are distributed on the basis of 25 percent to livestock and 75 percent to nonconsumptive and wildlife uses.

To support these allocations, 30 existing AMPs totaling 227,776 acres would be revised. Where monitoring indicates it is necessary (Appendices 2.8 and 3.1), 63 new AMPs affecting 294,798 acres would be developed. Six hundred and eighty-four allotments of 651,781 acres, would not be considered for AMPs at this time, because the allotments are too small or the majority of the land is private. A total of 4,442 acres remain as unallocated land in scattered, small tracts throughout the resource area. AMPs would be implemented on the average of ten per year.

The 63 proposed AMPs were selected by a system that considered acreage, range condition, public land percentage, watershed values or concern, and wildlife habitat values. Appendix 2.5 summarizes AMP rating criteria and factors in evaluation and implementation priority. On-the-ground inspections may reveal the need to substitute allotments which are as yet unscheduled. While it is expected that AMPs would continue to be developed beyond the short term implementation period, the analysis is limited to what is expected to occur in the short term to provide a comparison between the four alternatives in a common time period.

Grazing management will include monitoring of livestock grazing, while maintaining or improving range condition management would be in one of three categories: allotment management plans (AMPs), season and number, or custodial. Various grazing systems including rest rotation, deferred rotation, deferred, seasonal, short duration, or other systems which are variations or combinations of these would be applied. Season and number allotments would generally have deferred or seasonal systems, while custodial allotments would have seasonal use coordinated with the private land where the public land is a very small part of

the allotment and/or the goals of management could be met with this management level.

Development of range improvements on erosion susceptible areas will be avoided during the April-June period maintenance and new construction would not be allowed during wet periods and range improvements would not generally be located on floodplains. Soil, watershed and plant phenology capabilities will be considered when it is necessary to graze on floodplains during this period. Improved management and use supervision would result in improvement of riparian areas.

Land treatments would be implemented on about 128,000 acres when grazing treatments have not achieved objectives. About 230 miles of management fences would be needed to support grazing or land treatments and these would be built to assure movement of wildlife. There would also be 969 new water sources developed. Those identified for wildlife needs would be fenced, with water gaps for livestock access.

Control of noxious weeds such as leafy spurge, canada thistle, cocklebur and the knapweeds, is proposed for 4500 acres, using 2,4-D, Tordon and Roundup or any new herbicide providing more effective control. Biological control will be considered if proved effective. Special care would be taken with the use of pesticides around reservoirs and crucial wildlife habitat.

Control of prairie dogs on 2900 acres would be carried out in accordance with the statewide prairie dog management policy (Appendix 2.6) using zinc phosphide treated oats.

The estimated cost of range improvements is $11,955,751, based on current average cost per improvement (Appendix 2.7). Reservoirs that will be fenced for wildlife needs have not been identified and the additional cost is not included in the estimate.

TABLE 2-1
SUMMARY DATA FOR FOUR ALTERNATIVES

		ALTERNATIVE A Continued Development for Optimum Range Utilization	ALTERNATIVE B Enhanced Watershed Value and Wildlife Habitat	ALTERNATIVE C No Grazing	ALTERNATIVE D No Action
Existing AMPs	#(acres)	30(227,776)	30(227,776)	0	30(227,776)
Proposed AMPs	#(acres)	63(294,798)	63(294,798)	0	0
Non-AMPs	#(acres)	684(651,781)	684(651,781)	0	747(946,579)
Unallocated Lands	acres	*4,422	4,422	1,178,777	4,422
	TOTALS	1,178,777	1,178,777	1,178,777	1,178,777
Initial AUM Allocations					
Livestock		253,085	204,411	0	253,085
Nonconsumptive and Wildlife Uses		759,255	807,929	1,012,340	759,255
	TOTALS	1,012,340	1,012,340	1,012,340	1,012,340
Long-Term AUM Allocations					
Livestock		270,115	220,439	0	253,085
Nonconsumptive and Wildlife Uses		810,345	860,021	1,012,340	759,255
	TOTALS	1,080,460	1,080,460	1,012,340	1,012,340

*An additional 4,074 acres of land was withdrawn from grazing use in the Terry Badlands in 1966 and remains unallocated. This land is not included in this EIS discussion and analysis.

**A 19% reduction from Alternative A: 37,803 AUMs for crucial wildlife habitat
10,871 AUMs for spring deferment
Total Reduction: 48,674 AUMs

Alternative B: Enhanced Watershed Value and Wildlife Habitat

In this alternative, particular emphasis would be placed on the watershed and wildlife resources. This analysis shows the benefits and disadvantages of giving priority in vegetation allocation and range management to resources other than livestock forage production while allowing light to moderate grazing use by livestock.

Initial allocation of vegetation would be 20 percent to livestock and 80 percent to nonconsumptive and wildlife uses. Livestock allocations in this alternative are 204,411 AUMs, 19 percent lower than the current permitted use of 253,085 AUMs. Initial allocations to nonconsumptive and wildlife uses are 807,929 AUMs. Long term allocations, based on projected increases in vegetation production (due to land treatments and various grazing systems) are 220,439 AUMs to livestock grazing and 860,021 AUMs to nonconsumptive and wildlife uses. See Table 2-2 for summaries of allocations by alternative and Appendix 2.4 for specific allotment information.

The 30 existing AMPs would be continued and 63 allotments would be considered for AMP implementation. Monitoring would be done to maintain or improve range condition. Grazing treatments, including rest and/or deferred grazing and AMP objectives would be governed to meet the resource objectives of deferring grazing on floodplains and erosion susceptible areas during April, May and June and eliminating grazing on crucial wildlife winter range and riparian areas. Livestock would be excluded from reservoirs identified for wildlife needs with no provisions included for livestock watering.

Crucial wildlife habitat involving 193 allotments and 179,988 acres is identified on Map 2. This habitat reservation would reduce livestock allocations by 37,803 AUMs. An additional 10,871 AUMs would be lost through spring deferment, equaling the 48,674 AUM (19%) reduction in livestock allocations.

Mechanical treatments (Appendix 2.8) and associated grazing treatments could occur on about 128,000 acres in this alternative. Approximately 230 miles of management and 1,532 miles of exclosure fences built to restrict livestock use of crucial lands with minimal restriction to wildlife movement and 969 new water developments are also proposed.

Chemical control of noxious weeds is proposed for 4500 acres. Special care would be taken with the use of pesticides around reservoirs and crucial wildlife habitat. Black-tailed prairie dog ecosystems would be protected and maintained, being controlled only if they threaten private lands and/or crucial wildlife habitat.

The estimated cost of range improvements in this alternative is $15,476,551, based on current average cost per improvement (Appendix 2.7). Reservoirs that would be fenced to exclude livestock have not been identified and the additional cost is not included in the estimate.

Alternative C: No Grazing

No livestock would be permitted to graze on public lands in this alternative. The analysis provides a basis of comparison for the environmental, social and economic consequences of the other alternatives.

Current grazing privileges would be revoked, including the present 30 AMPs. All agreements with cooperative state grazing districts would be affected as well. No range improvements would be built or maintained unless the improvements were considered necessary for watershed or wildlife resources.

This program would eliminate the current permitted livestock use of 253,075 AUMs. In the worst-case analysis, BLM would require fencing of public lands to prevent livestock trespass. More than 7,400 miles of fences would be necessary for this undertaking, costing $16,944,100, according to current cost estimates (Appendix 2.7). This would be a cost to the adjacent private landowners.

Alternative D: No Action

This alternative would "freeze" the current range program as it is today. Initial and long term allocations under this alternative, regardless of range condition, would be 253,085 AUMs to livestock and 759,255 AUMs to nonconsumptive and wildlife uses as summarized in Table 2-1 and detailed by allotment in Appendix 2.4. AMPs in effect would continue but no new range improvements (reservoirs, fences, mechanical or chemical treatments, or pipelines) would be developed. Changes in levels of permitted livestock use would not be allowed, regardless of need, and no new AMPs would be implemented. Maintenance of current improvements would be allowed.

Essentially all future options in range management would be eliminated in this alternative. There would be no opportunity to correct erosion problems, to increase or decrease livestock numbers, to change kinds of livestock, to adjust seasons of use or to improve range management.

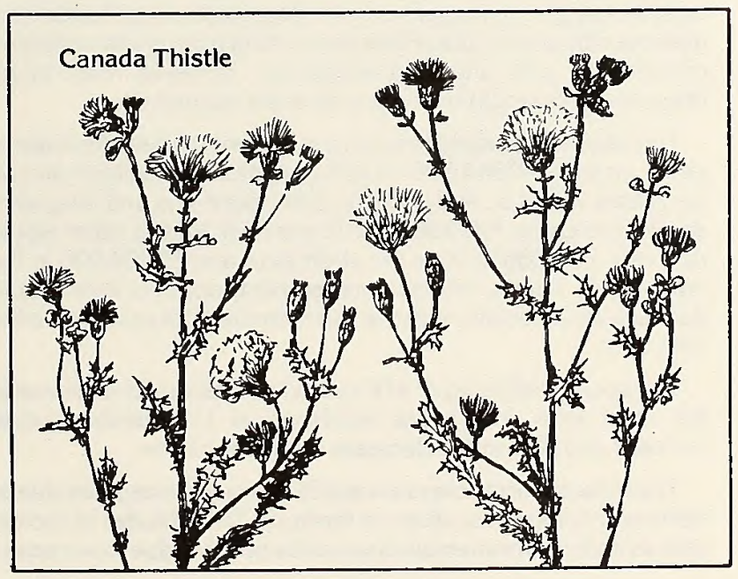
By freezing the present use of vegetation, BLM and the public can view the consequences of continuing present range trends in the Big Dry EIS area. The analysis shows future conditions of soil, vegetation and watershed.

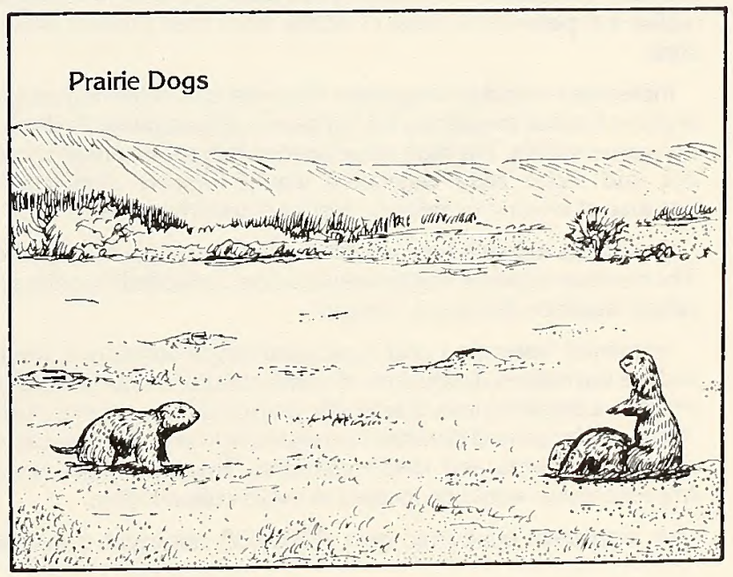
There would be no implementation costs for this alternative as fence maintenance is the responsibility of the operator and by 1984, maintenance cost of reservoirs, springs, etc., would also be their responsibility.

TABLE 2-1 (Continued)
SUMMARY DATA FOR FOUR ALTERNATIVES

		ALTERNATIVE A Continued Development for Optimum Range Utilization	ALTERNATIVE B Enhanced Watershed Value and Wildlife Habitat	ALTERNATIVE C No Grazing	ALTERNATIVE D No Action
Grazing Treatments On Existing 30 AMPs					
26	(acres)	*DR (199,551)	DR (199,551)	—	DR (199,551)
3	(acres)	**RR (24,639)	RR (24,639)	—	RR (24,639)
1	(acre)	Not Implemented (3,586)	Not Implemented (3,586)	—	Not Implemented (3,586)
Mechanical Treatments	acres	127,929	127,929	0	0
Chemical Treatment	acres				
Noxious Weed Control		4,500	4,500	As needed to protect private lands & crucial wildlife habitat	0
Prairie Dog Control		560	As needed to protect private lands & crucial wildlife habitat	0	
Water Developments #		969	969	As needed for wildlife and watershed	0
Additonal Fences	(miles)	230	***1,762	7,367 (to fence BLM lands off)	0

*Deferred rotation
**Rest Rotation
***See Chapter 4, Alternative B, Livestock


Canada Thistle


Prairie Dogs

SUMMARY OF ENVIRONMENTAL CONSEQUENCES BY ALTERNATIVE

A comparison of the impacts on major resources is presented in Table 2-2. It was found that there would be no significant impacts and no significant differences in impacts between alternatives for climate, air quality and geology. These components are therefore not included in the summary table.

Quantification of resource factors is given when possible. The reference point for determining change is the existing situation. During the years 1983-88, the selected grazing management alternative or combination of alternatives would be implemented. Short term impacts are those that would occur during this implementation period, primarily from range developments. Long term impacts would occur approximately by the year 2003. The following discussion emphasizes the most significant impacts by alternative. The preferred alternative, based on benefit-cost analysis and public comment, is Alternative A, "Continued Development For Optimum Range Utilization."

Alternative A: Continued Development For Optimum Range Utilization

Watershed condition would improve in the long term as sediment yield would be reduced by 20 percent and water yield by 18 percent. Soil losses from range developments would be an insignificant short term consequence. Consumptive water use by livestock would increase slightly. More vegetation production would result in allocating 50 percent of the increase to nonconsumptive uses, improving watershed protection.

Ecological range condition would be improved or maintained in good to excellent condition. Areas in less than good condition (155,462 acres) would improve in condition with a resultant increase of vegetation equivalent to 68,120 AUMs.

Riparian vegetation along streams and below reservoirs would increase. Livestock, nonconsumptive uses and wildlife would all realize a 6 percent increase of AUMs from their present allocations.

Increases in residual vegetation from rest and deferment would improve habitat conditions for big game, upland game birds and nongame wildlife. The high value riparian habitat, reservoir shoreline and saline seep vegetation would improve significantly because of fencing or periodic rest and deferment treatments.

Reservoirs identified as suitable for fisheries would be fenced. The number of prairie dog towns would be controlled if significant range resource damage is caused.

Improved watershed and ecological range conditions would reduce the natural destruction of some cultural resource sites by erosion. Long term loss of scientific data could occur if sites were destroyed by ground disturbances resulting from implementation of range projects and land treatments. However, most range improvements would be located to avoid cultural sites.

A long term economic gain ($205,638 annually) would be realized by 350 ranch operations. Permit values would increase by $1,703,000. There would be no change in ranch employment in the short or long term. These increases would improve the social well-being of approximately 350 ranch families in the long term.

The attitudes of ranchers toward BLM resulting from increased forage allocations would be positive. The attitudes of recreationists and environmentalists would generally favor multiple use of public lands and would favor the proposed action.

Long term regional earnings would increase by $1,635,000 annually and employment would increase by 134 people.

The total implementation cost of this alternative would be $11,955,751.

Alternative B: Enhanced Watershed Value and Wildlife Habitat

Sediment and water yields would decrease by 28 and 23 percent, respectively, which would improve water quality. Consumptive use of water by livestock would increase slightly. Improvements in watershed condition would be due mainly to deferment of grazing for 3 months in the spring.

The proposed land treatments would improve ecological range condition. Of the resultant increase in vegetation, 25% would be allocated to livestock. Forage allocations to livestock would decrease by 48,674 AUMs initially, but would increase in the long term to 220,439 AUMs or a 7% increase.

More residual vegetation would result from a July 1 deferment as well as other rest or deferment treatments on AMPs improving big game, upland game bird and nongame wildlife habitat. Prairie dog towns would consume additional acreage and reduce additional livestock forage. Thirty-three additional fisheries reservoirs are proposed which would be fenced, removing approximately 50 AUMs from livestock use.

Improved watershed and ecological range conditions would reduce the natural destruction of some cultural resource sites by erosion. Long term loss of scientific data could occur if sites were destroyed by ground disturbances resulting from implementation of range projects and land treatments. However, most range improvements would be located to avoid cultural sites.

This alternative would result in a short term annual decrease in ranch income of $544,306 on 418 operations. Long term annual decreases would be $481,435 on 335 operations and long term annual increases $90,938 on 176 ranches. Permit value would decrease by $4,866,000 in the short term and $3,264,000 in the long term. Ranch related employment opportunities would decrease by 28 positions in the short term and 23 positions in the long term.

The social well-being of 418 ranch families would decrease in the short term. The social well-being of 176 families would increase and 335 would decrease in the long term.

The attitudes of ranchers toward BLM would be negative due to decreased forage allocations to livestock. The attitudes of recreationists and environmentalists would be positive, due to increased wildlife and reduction in livestock conflicts.

Total earnings would increase by $1,358,000 annually in the short term and decrease by $231,000 annually in the long term. Total employment would increase by 106 people in the short term and decrease by 23 persons in the long term.

Implementation costs of this alternative would be $15,476,551.

Alternative C: No Grazing

The net effect of the elimination of livestock grazing on public lands would be a 54 percent decrease in sediment yield and a 30 percent decrease in water yield in the long term. Additionally, water quality would improve significantly because of reduced levels of fecal bacteria, suspended sediments and nutrients contained in runoff water. Consumption of water by livestock would decrease from 2,794 acre-feet/year to zero.

Ecological range condition would improve in the long term as succession to ecological climax progressed. Ecological range condition would improve in the long term as succession to ecological climax progresses where there is no infestation by noxious weeds. However, locations where noxious weeds are present, there would be additional acreages infested with noxious weeds and a continual decline of range condition. Noxious weeds and prairie dogs would be controlled only when threatening to private and or crucial wildlife habitat. The condition of riparian, shoreline and saline seep vegetation would improve over the entire EIS area.

Eliminating livestock from public lands would not necessarily improve habitat for many of the wildlife species. Big game forage could be reduced as plant communities trend toward climax vegetation. However, the additional forage and cover available would satisfy the needs of increased wildlife populations in most cases. High value riparian habitat would increase. The release of vegetation that would result from the absence of livestock grazing could be expected to limit or allow only slight increases of prairie dog towns.

For the short and long term, income would decrease on all 608 operations. The decrease in net income would be 24% of the current total.

Ranchers' attitudes and perceptions of BLM would be very negative because of the elimination of grazing on public lands in the EIS area. Attitudes of environmentalists and recreationists would be mixed as removal of livestock grazing would improve the naturalness but the reactions of ranchers to their loss of grazing might result in reduced access to public lands.

Regional economic impacts would be decreases in annual earnings of $501,000 in the short term and $3,009,000 in the long term. Employment opportunities would decrease by 60 in the short term and 303 in the long term.

Total implementation of this alternative would cost $16,944,100, due to construction of 7,400 miles of exclosure fences around public lands and control of noxious weed and prairie dogs.

Alternative D: No Action

Watershed condition would deteriorate with an increase in sediment and water yields of 15% and 12%, respectively, while the quality of surface water would deteriorate in the long term. Consumptive uses of water by livestock would remain at 2,794 acre-feet/year.

Ecological range condition, riparian areas and floodplains would decline in the long term. Without the control of prairie dogs and noxious weeds, forage supplies would be reduced, resulting in overuse of the range. Vegetation allocations would remain at their present levels of 253,085 AUMs to livestock and 759,255 AUMs to nonconsumptive and wildlife uses.

Wildlife would not be adversely affected, but competition between livestock and wildlife for crucial wildlife habitat would be significant, particularly during the spring and winter seasons. Some viable fisheries reservoirs would be lost due to accelerated sedimentation. The potential expansion of prairie dog towns would reduce the yearlong food and cover of many other wildlife species not associated with prairie dog towns.

Ranchers interviewed anticipated that a no action proposal would have negative impacts on their operations.

There would be no implementation costs for this alternative as maintenance to fences would be the responsibility of the operator and by 1984, maintenance cost of reservoirs, springs, etc., would also be their responsibility.

TABLE 2-2
SUMMARY OF ENVIRONMENTAL CONSEQUENCES BY ALTERNATIVE

Environmental Component	Existing Situation	Alternative A - Continued Development for Optimum Range Utilization		Alternative B - Enhanced Watershed Value and Wildlife Habitat		Alternative C - No Grazing		Alternative D - No Action	
		Short Term	Long Term	Short Term	Long Term	Short Term	Long Term	Short Term	Long Term
VEGETATION									
ACRES/CLASS									
Good & Excellent	1,004,061	Increasing = +	1,118,806	+	1,118,806	+	-	+	-
Fair	93,268	Decreasing = -	Near 0	-	Near 0	-	+	-	+
Poor	2,223	Decreasing = -	Near 0	-	Near 0	-	+	-	+
Unclassified	19,254	Stand quality would change in the alternatives but without classification the acres unclassified would not change.							
Tame Pasture (Change in stand quality)	59,971	Static = s	+	s	+	s	-	s	-
Production (AUMs)	1,012,340	1,012,340	1,080,460	1,012,340	1,080,460	1,012,340	1,080,460	1,012,340	1,012,340
Allocation Livestock	253,085	253,085	270,115	204,411	220,439	0	0	253,085	253,085
Nonconsumptive & Wildlife	759,255	759,255	810,345	807,929	860,021	1,012,340	1,080,460	759,255	759,255
LIVESTOCK									
Numbers (800#s/mo)									
6 mo. season	42,181	42,181	45,019	34,069	36,740	0	0	42,181	42,181
8 mo. season	31,636	31,636	33,764	25,551	27,555	0	0	31,636	31,636

TABLE 2-2 (continued)
SUMMARY OF ENVIRONMENTAL CONSEQUENCES BY ALTERNATIVE

Environmental Component	Existing Situation	Alternative A - Continued Development for Optimum Range Utilization		Alternative B - Enhanced Watershed Value and Wildlife Habitat		Alternative C - No Grazing		Alternative D - No Action	
		Short Term	Long Term	Short Term	Long Term	Short Term	Long Term	Short Term	Long Term
WATERSHED*									
Sediment Yield	1,163	1,163	929	1,158	831	1,157	533	1,156	1,327
Water Yield	60,194	60,194	49,097	60,194	46,576	60,070	42,249	60,156	67,272
Water Quality	+	0	+	0	+	0	+	0	-
Water Consumption	2,794	2,794	2,982	2,257	2,434	2,794	0	2,794	2,794

* All figures are acre-feet/year

\+ Indicates increased quality

\- Indicates decreased quality

0 Indicates no change

TABLE 2-2 (continued)
SUMMARY OF ENVIRONMENTAL CONSEQUENCES BY ALTERNATIVE

Environmental Component	Existing Situation	Alternative A - Continued Development for Optimum Range Utilization		Alternative B - Enhanced Watershed Value and Wildlife Habitat		Alternative C - No Grazing		Alternative D - No Action	
		Short Term	Long Term	Short Term	Long Term	Short Term	Long Term	Short Term	Long Term
WILDLIFE									
Big Game Pops. a/	19,508	s	s	s	(+)	(+)	(-)	-	-
Upl. Game Birds a/	Unknown	s	(+)	(+)	(+)	+	(-)	s	-
Waterfowl a/ Nos	Unknown	s	(+)	(+)	s	+	(-)	-	-
Crucial Habitats a/	240,000AC	s	(+)	(+)	+	+	(-)	-	-
Prairie Dogs a/	2,900AC	-	-	(+)	+	s	s	+	+
Fisheries b/	17	(+)/0	+/0	+/33	+/33	+/?	+/?	-/0	-/0

a/ Response to proposed actions by alternative
Stable or neutral response: s
Decline in condition or numbers: (-), slight; - moderate to significant
Improvement or increase: (+) slight; + moderate to significant

b/ Number of Reservoirs

TABLE 2-2 (continued)
SUMMARY OF ENVIRONMENTAL CONSEQUENCES BY ALTERNATIVE

Environmental Component	Existing Situation	Alternative A - Continued Development for Optimum Range Utilization		Alternative B - Enhanced Watershed Value and Wildlife Habitat		Alternative C - No Grazing		Alternative D - No Action	
		Short Term	Long Term	Short Term	Long Term	Short Term	Long Term	Short Term	Long Term
CULTURAL RESOURCE									
Potential Sites (est.)	4,000 to 13,000								
Potential Sites Disturbed (if no mitigating measures are applied)		200 to 1,000 Sites		200 to 1,000 Sites		0	0	0	0

TABLE 2-2 (Continued)
SUMMARY OF ENVIRONMENTAL CONSEQUENCES BY ALTERNATIVE

Environmental Component	Existing Situation	Alternative A - Continued Development for Optimum Range Utilization		Alternative B - Enhanced Watershed Value and Wildlife Habitat		Alternative C - No Grazing		Alternative D - No Action	
		Short Term	Long Term	Short Term	Long Term	Short Term	Long Term	Short Term	Long Term
SOCIAL ECONOMIC Ranch Impacts									
Number of ranches	608								
Ranch income	8,892,655								
Number of ranches with income inc.		0	350	0	176	0	0	0	0
Total dollar increase		0	$205,638	0	$90,938	0	0	0	0
Nuumber of ranches with income decrease		0	0	418	335	608	608	0	0
Total Dollar Decrease		0	0	544,306	481,435	3,221,688	3,221,688	0	0
Permit values	24,614,800	0	+1,703,000	-4,866,000	-3,264,000	-24,614,800	-24,614,800		
Ranch employment	363	0	0	-28	-23	-303	-303	0	0
Total Impact Of Increases		None	Moderately Significant	Moderately Significant	Moderately Significant	Highly Significant	Highly Significant	None	None

TABLE 2-2 (continued)
SUMMARY OF ENVIRONMENTAL CONSEQUENCES BY ALTERNATIVE

Ennvironmental Component	Alternative A - Continued Development for Optimum Range Utilization		Alternative B - Enhanced Watershed Value and Wildlife Habitat		Alternative C - No Grazing		Alternative D - No Action	
	Short Term	Long Term	Short Term	Long Term	Short Term	Long Term	Short Term	Long Term
No. Families With increase In Social Well Being	0	465	0	234	0	0	0	0
No. Families With Decrease in Social Well Being Unclassified	0	0	555	445	808	808	0	0
Social Impact Assessment	-would meet approval of area ranchers satisfied with present level and kind of mgmt; -provisions for range improvements would also meet their approval; -local increases in wildlife numbers and improvements in riparian habitat would benefit with some reservations groups concerned with wildlife protection and also hunters & recreationalists	-same as short term -in addition some ranchers gain through income increases; could result in enhanced ability to maintain preferred lifestyle	-some ranchers would be required to alter historic mgmt. patterns, forego economic gain, and in extreme cases, may be displaced; -likely cause some rancher resentment at loss of AUMs to wildlife resulting in strained relations with BLM; -increase in local wildlife numbers & protection of riparian areas would result in increased hunting & recreation opportunities on public lands	-same as short term; -in addition, some ranchers would experience opportunities for income gain resulting in enchanced sense of well being	-ranchers would be required to alter historic mgmt. patterns, forego economic gain, and in extreme cases, may be displaced; -wholesale resentment of BLM would likely result and persist into future; -increases in wildlife numbers & improved riparian habitat would benefit wildlife interest groups & hunters, although they do not espouse wholesale removal of cattle from public lands	-same as short term	-continued absence of range improvements would frustrate attempts at long-range mgmt. of operations; -decrease in ranch income is a possibility, resulting in lowered sense of well being + std. of living; -lack of extraordinary measures to protect wildlife habitat, especially riparian areas could meet opposition from wildlife interest groups.	-same as short term; -eventual decline in wildlife numbers would decrease hunting & viewing opportunities on public lands

TABLE 2-2 (continued)
SUMMARY OF ENVIRONMENTAL CONSEQUENCES BY ALTERNATIVE

Environmental Component	Existing Situation	Alternative A - Continued Development for Optimum Range Utilization		Alternative B - Enhanced Watershed Value and Wildlife Habitat		Alternative C - No Grazing		Alternative D - No Action	
		Short Term	Long Term	Short Term	Long Term	Short Term	Long Term	Short Term	Long Term
REGIONAL IMPACTS									
Area Earnings	$174,888,000	+ 1,635,000	0	+ 1,358,000	$-231,000	-501,000	-3,009,000	0	0
Area Employment	17,631	+ 134	0	+ 106	- 23	- 60	- 303	0	0
Total impact to Area Economy		Insignificant	None	Insignificant	Insignificant	Insignificant	Moderately Significant	None	None
Implementation Cost		11,958,051		11,955,251		20,769,100*		0	

*inciudes $16,944,100 private investment

CHAPTER 3

THE AFFECTED ENVIRONMENT

CLIMATE

The dry continental climate of the Big Dry EIS area is characterized by short summers with mild to warm temperatures and long cold winters. Mean air temperatures average 72 degrees Fahrenheit (°F) in July and 15°F in January. Temperatures fluctuate greatly during all seasons of the year, limiting the growing season to between 110-130 days.

Precipitation levels fluctuate, averaging 12 to 14 inches. The Big Dry EIS area receives the greatest concentration (80%) of precipitation between April and September as rain. The annual average snowfall in the area is approximately 30 inches.

GEOLOGY

Geologic formations exposed at the surface of the EIS area consist of sedimentary strata that range from mid-Cretaceous to early Tertiary age. The older Cretaceous rocks are limited to exposures along the Missouri River and along structural trends associated with the Central Montana Uplift and the Cedar Creek Anticline. The Tertiary formations are the most widespread and resulted from the accumulation of nonmarine sediment in the large Williston Basin.

WATERSHED

Soils

The soils of the EIS area are derived mainly from soft sedimentary bedrock, local and regional alluvium from mixed sources, shale, siltstones, claystones, and to a minor amount, glacial till. Because of this the area has complex and diverse soil patterns, varying greatly in character and productivity.

For descriptive purposes in this EIS, approximately 150 soil series were grouped into 15 geomorphic soil subgroups (Map 3, Map Supplement). Each of these soil subgroups has unique capabilities and limitations for land uses and treatments based upon topography and soil properties. Selected vegetation characteristics of the geomorphic soil subgroups are also given in Appendix 3.1.

About 63 percent (742,600 acres) of public lands in the EIS area have moderate to high potential for water erosion. Allotments in areas dominated by soil subgroups 1, 11, 13, 14 and 15 have a moderate to high water erosion hazard because of infiltration, permeability, texture, structure and slope. Allotments in areas dominated by subgroups 3, 4, 5, 6, 10 and 12 have slight to moderate water erosion hazards.

Based on step-point transects, vegetation cover on all 15 soil subgroups on public lands range from 9-100 percent under current vegetation allocations which are sometimes less than the minimum necessary for maintaining soil stability and productivity. Desired soil vegetation cover percentages (called "Target Soil Vegetation Cover") have been developed for each range site. (Appendices 3.2 and 3.3) Target soil vegetation covers are needed to establish acceptable vegetation cover on each range site. This would help to ensure adequate soil protection and help prevent sediment loss into nearby watershed and streams. These target covers would be updated periodically and used in activity planning and development of allotment management plans.

Soils in subgroups 1, 14 and 15, comprising 163,800 acres of public lands, are unsuited for season long grazing because of the severe erosion potential of soils on shale uplands and along stream channels. These soils are most suited to rest rotation grazing systems due to the fragile nature of the soils, susceptibility to trampling and soil compaction during seasonally wet periods and the clayey textures in shale areas. Soils in these subgroups are also well suited to deferred and deferred rotation grazing systems. Because of the topography, slope, soil texture and water erosion potential, mechanical treatments are not recommended.

Soils in subgroups 2, 4, 5, 7, 9, 12, and 13 on a total of 878,300 acres of public lands, are suited to all of the grazing systems listed in the vegetation section of Alternative A. Mechanical treatments (Appendix 2.8A) could increase production up to four times on selected soils by changing vegetation composition, improving infiltration, reducing runoff and catching more snow.

The 136,000 acres of public land in soil subgroups 3, 8, 10, and 11 are well suited to deferred, deferred rotation and rest rotation grazing systems. Grazing systems with late spring season of use would stabilize watershed conditions and maintain water quality in these areas.

Riparian soils (located in subgroup 1, which totals 75,000 acres of public lands) are occasionally saturated with water in the spring and transmit all inflow water except that lost to evapotranspiration The slow release of water from riparian zones prolongs streamflow periods for offsite or downstream users. Riparian zones are also sources for recharge of subterranean aquifers.

Riparian zones are highly productive forage sites and livestock use these areas intensively. Riparian vegetation provides rubbing and shade sources for cattle, in addition to forage. Erosion, with attendant stream channelization and sedimentation, has developed as a result of livestock concentrations in these zones. Riparian soils are best suited to rest rotation grazing and deferred rotation grazing systems.

Selected series within the 15 geomorphic soil subgroups may be mechanically treated to increase vegetation production, establish soil cover or decrease soil erosion.

Pitting, chiselling and ripping may be used on selected soil series within geomorphic soil subgroups 2, 3, 4, 7, 8, 11 and 13. Scalping and contour furrowing may be done on selected series in subgroups 2, 4, 7, 9, 11 and 13. Slopes in excess of 12% are considered unsuited to these treatments due to increased erosion problems. Selected soils within 1, 2, 4, 5, 7, 9, 11, 12 and 13 may lend themselves to interseeding where an inadequate seed source of desirable species or a vegetation conversion is desirable. Plowing and seeding on selected soils in subgroups 1, 2, 4, 5, 7, 9, 11, 12 and 13 may be applied after less destructive and costly measures have been found inadequate. Chaining (cabling, railing), dozing and rotobeating on selected soils within subgroups 1,

4, 5, 7, 9, 11, 12 and 13 may be performed if slopes are less than 8%. Fire may be used on all subgroups, but are most favorable on subgroups 1, 2, 4, 5, 7, 10, 11, 12 and 13. Least favorable soils are in subgroups 6, 14 and 15, because vegetation is so sparse that any removal may result in increased erosion beyond acceptable levels.

Saline seeps are wet, saline soils in drainages below reservoirs and on some other slopes and drainages. Water impoundment structures often produce areas of seepage below them. Water percolates through reservoirs, dams and abutments, dissolving salts from local soils. These salts accumulate at the soil surface by the upward capillary movement of water and its subsequent evaporation. Some saline water from the seeps moves down drainages, causing changes in vegetation composition and reducing soil productivity, particularly on riparian soils.

Groundwater

The availability of groundwater in the Big Dry EIS area is directly related to the geology of the area. The Big Dry area is somewhat like a bowl filled with about 10,000 feet of layered material with some layers transmitting enough water to supply wells (Figure 3-1).

The chemical quality of the groundwater in the EIS area shows considerable variation. Water in the shallow aquifers is chemically dynamic, being subject to dilution by recharge, concentration by evaporation and transpiration, and chemical reactions by bacterial activity, oxidation, and other factors. Water in deeper aquifers is chemically static, with chemical changes limited to interactions between the water and rocks (USGS & MBMG 1978).

The Fort Union formation (Figure 3-1 and Appendix 3.4) covers approximately 80% of the EIS area and is the most widely used aquifer. Wells drilled 100 to 400 feet into this formation generally produce adequate water for stock and domestic needs. Two to 12 gallons per minute (gpm) are typical yields. High sodium content of Fort Union water usually precludes its use for irrigation.

The Fox Hills-Lower Hell Creek formations form a continuous aquifer system which is capable of producing water almost anywhere in the EIS area. The depth to this aquifer is 600 to 1,000 feet.

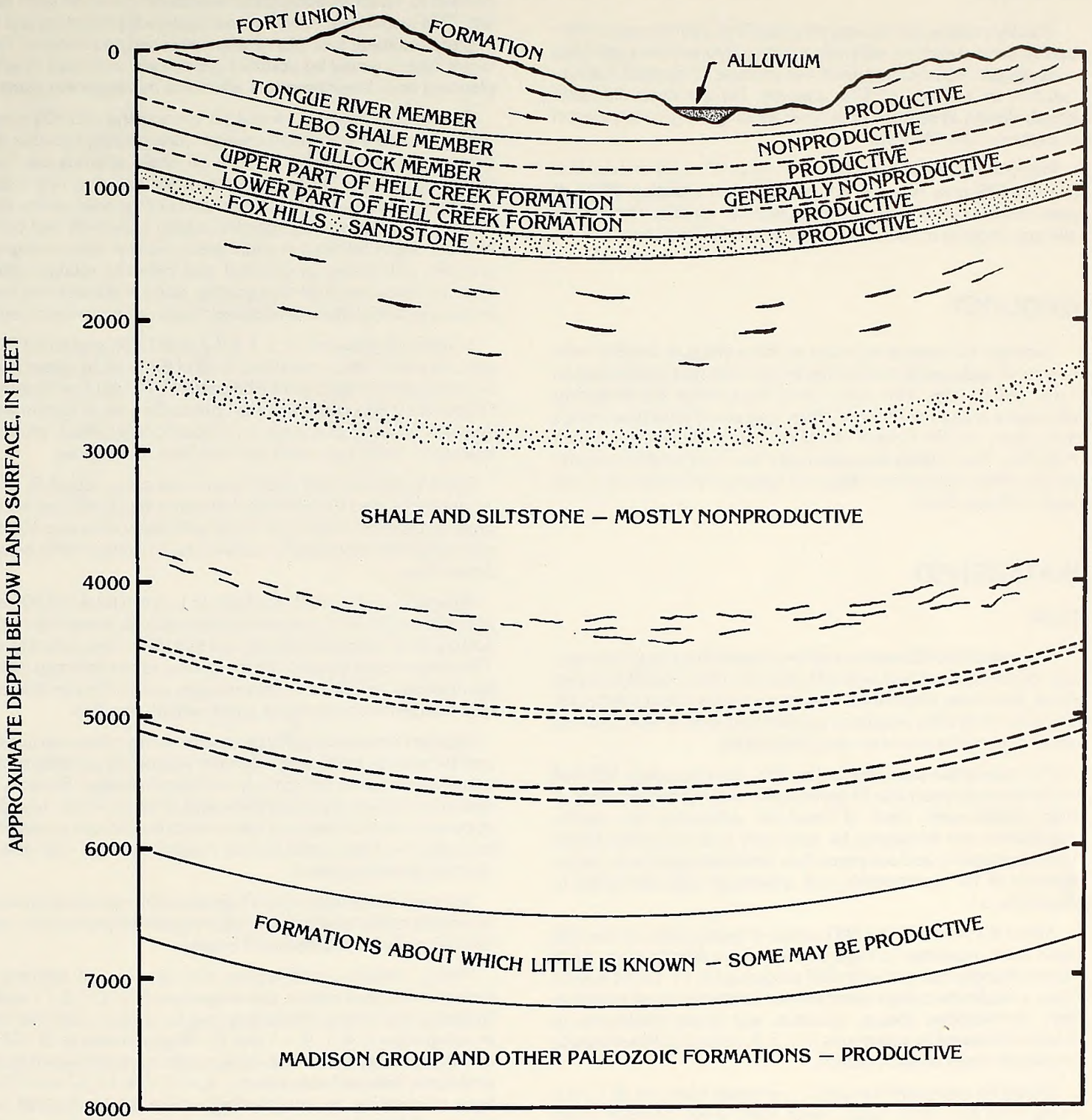
Alluvium and terrace deposits occur locally along the Yellowstone and Missouri Rivers and along other perennial streams and their tributaries in the EIS area. These deposits lie above the Fort Union Formation. Irrigation wells yielding up to 1,000 gal./min. have been developed from the alluvium in the major river valleys. However, due to their limited area extent, alluvium deposits are minor producers of groundwater when compared to other formations in the area.

On public land, there are approximately 250 wells and 100 springs. All supply water for wildlife and livestock consumption.

Surface Water

The Missouri and Yellowstone Rivers are the major drainages in the EIS area. The Missouri River, which flows in an easterly direction, drains most of the northern portion of the area. The Yellow-

FIGURE 3-1 WATER BEARING FORMATIONS OF THE BIG DRY EIS AREA



The Big Dry EIS Area is underlain by several units that are productive aquifers

Source: USGS and MBMG, 1978

stone River flows northeasterly and drains most of the southern portion. Smaller drainages include the Musselshell River, which flows northerly to the Missouri River and drains the extreme western portion of the area, the Powder River, which flows northerly to the Yellowstone, and Beaver Creek, which is a tributary to the Little Missouri River. Both the Powder River and Beaver Creek drain the southeastern portion of the area. Twenty-nine miles of perennial streams and 150 miles of major intermittent streams occur on public lands. In addition, approximately 850 reservoirs also occur on public lands. Average annual runoff for the EIS area is approximately 0.5 inch (*USGS Water Resources Data for Montana*).

Most major intermittent streams exhibit a sodium sulfate-type water Appendix 3.5). Total dissolved solids (TDS) in these streams are generally high enough to preclude human consumption (McKinley 1979; Montana Testing Labs 1981). The water in these streams is suitable for irrigation only during moderate to high flows from snowmelt and spring rains. The water is usually of high enough quality for livestock watering whenever there is flow. Standing water in these intermittent streams is generally too high in TDS for any use.

Surface water quality varies among the perennial streams in the EIS area. Waters in the Yellowstone and Missouri Rivers are good for domestic, stock, and irrigation purposes. The Musselshell River is marginal for domestic and irrigation uses, but good for stockwater. The Powder River is high in total dissolved solids and suspended sediment. Its water is fair to good for livestock, but unsatisfactory for domestic use.

Reservoir sediment studies were conducted on fourteen reservoirs in the summers of 1980 and 1981. The reservoirs were placed into one of four hydrologic geomorphic areas based on the soils of the respective watershed. Results (Appendix 3.6) indicate hydrologic geomorphic areas I and III tend to be lower producers of runoff and sediment than areas II and IV. Ranges for runoff and sediment production appear in Figure 3-2. These ranges were later used to determine water and sediment yields for each of the four proposed alternatives.

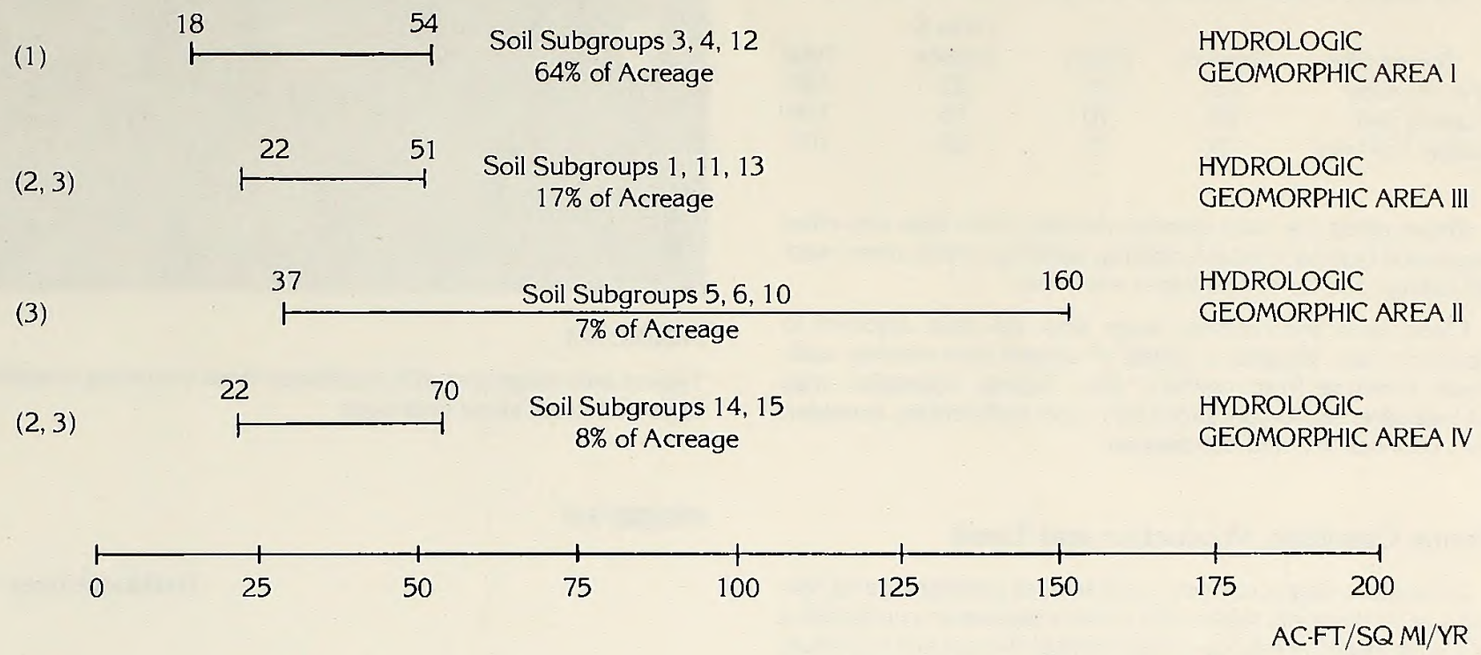
VEGETATION

The vegetation community on public lands is composed of the following major types: grassland 45%, badland 23%, sagebrush-grassland 21%, tame pasture (primarily crested wheatgrass) 5%, conifers 3%, halophytic shrub 2%, broadleaf trees with open canopy 1%, and broadleaf trees with closed canopy and mesic shrubs less than 1% each. Figures 3-3 and 3-4 are typical of the area. Rangelands which are predominately a needlegrass-wheatgrass-grama association. Areas which have more than 10 percent canopy cover of trees are grazable woodlands. The general vegetation communities of the 15 soil subgroups are noted in Appendices 3.1 and 3.2, along with possible management practices. Plant communities are described in detail by range site in the USDA-SCS MT Technical Guide, 1979.

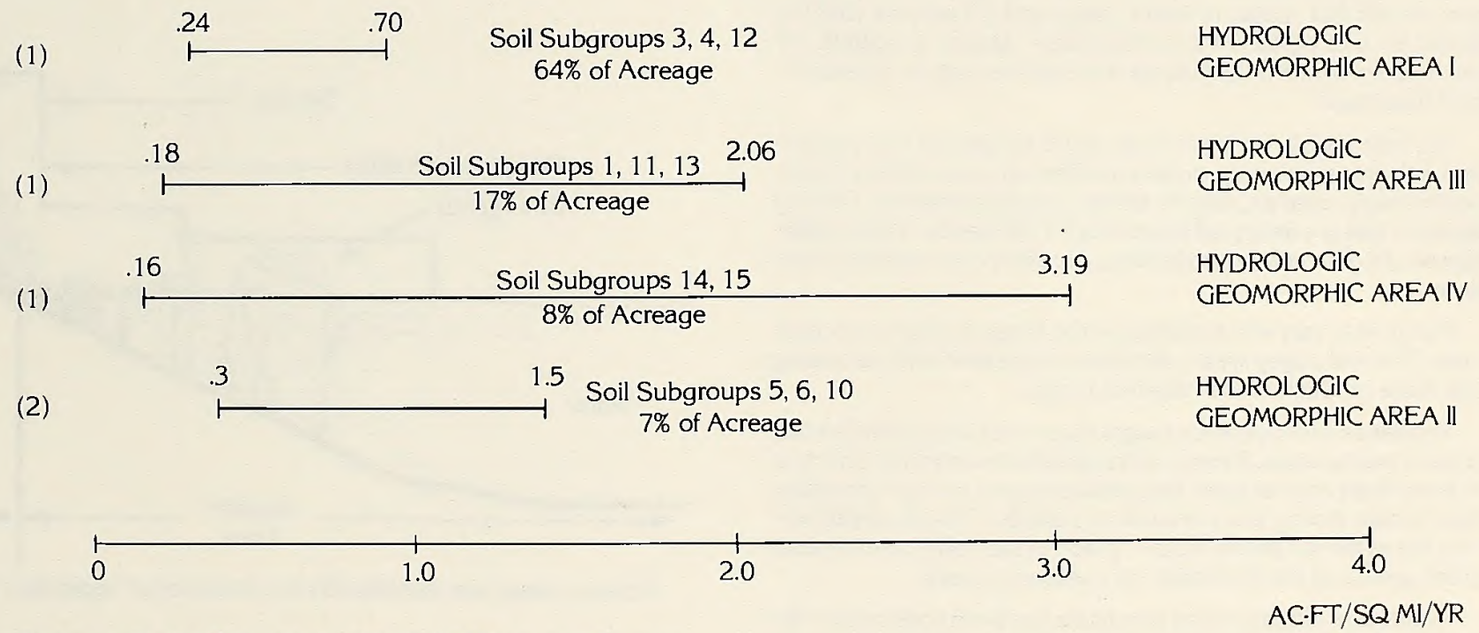
Riparian zones are defined as a specialized form of wet meadow producing specific vegetation types (Figure 3-5). Riparian zones are wet or subirrigated with vegetation common to wet meadow,

FIGURE 3-2
AGGREGATIONS OF SOIL SUBGROUPS BY EROSION/SEDIMENT AND WATER YIELD POTENTIAL
(REPRESENTS 96% OF THE PUBLIC LAND ACREAGE)

WATER YIELD RANGES



SEDIMENT YIELD RANGES



Sources: BLM 1981A, BLM 1981B, USGS Annual Reports.

subirrigated or saline lowland range sites. The relative vegetation composition (by weight) of grasses, forbs, and trees and shrubs on each rangesite (wet meadow, subirrigated or saline lowland) is shown in Table 3-1.

TABLE 3-1
PERCENT RANGE SITE VEGETATION COMPOSITION

Range Site	Grasses	Forbs	Trees & Shrubs	Total
Wet Meadow	65	10	25	100
Subirrigated	75	10	15	100
Saline Lowland	75	5	20	100

These zones are used disproportionally more than any other vegetation type for livestock grazing, watering, shade, travel, wildlife habitat, and for concentrated waterflow.

Floodplains and overflow range sites are often adjacent to riparian zones. Vegetation typical of upland sites receives additional moisture from overland flow. Woody vegetation may include silver sagebrush, snowberry, rose, buffaloberry, boxelder, elm, chokecherry, and cottonwood.

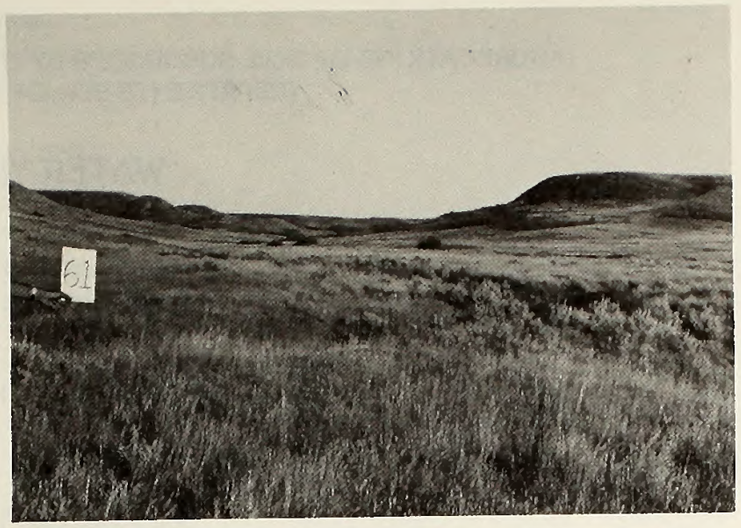


FIGURE 3-3
Typical area rangeland with deciduous trees occurring in waterways and north slope drainages

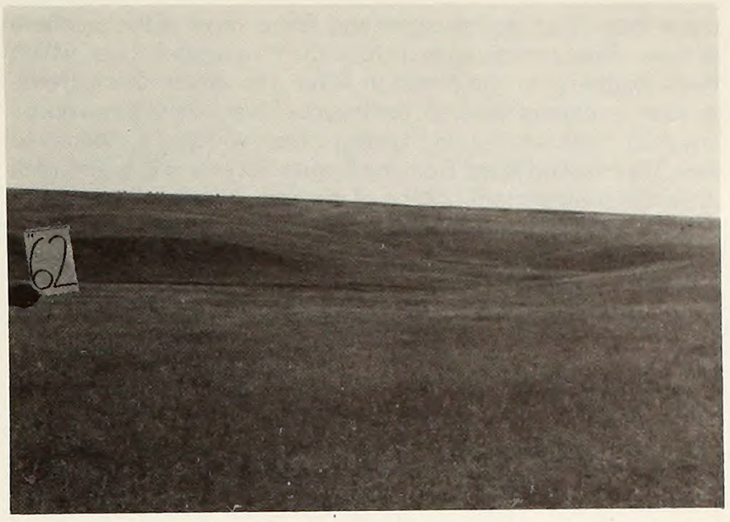


FIGURE 3-4
Typically rolling topography with predominantly a grass/shrub vegetation community

Range Condition, Production and Trend

Ecological range condition expressed as excellent, good, fair, poor or unclassified, reflects the current vegetation composition of the rangeland in relation to the potential climax plant community. The ecological range condition of the public lands is 85% good and excellent, 8% fair, 2% poor, 1.6% unclassified and 5.1% tame pasture as mapped by BLM specialists in 1979 and 1980. See Table 3-2. Of the 155,462 acres in less than good condition, 61 percent (95,491 acres) is native range and 39 percent (59,971 acres) is tame pasture. Most of the tame pasture is suitable for land treatment and 67,958 acres of the native range is suitable for land treatment.

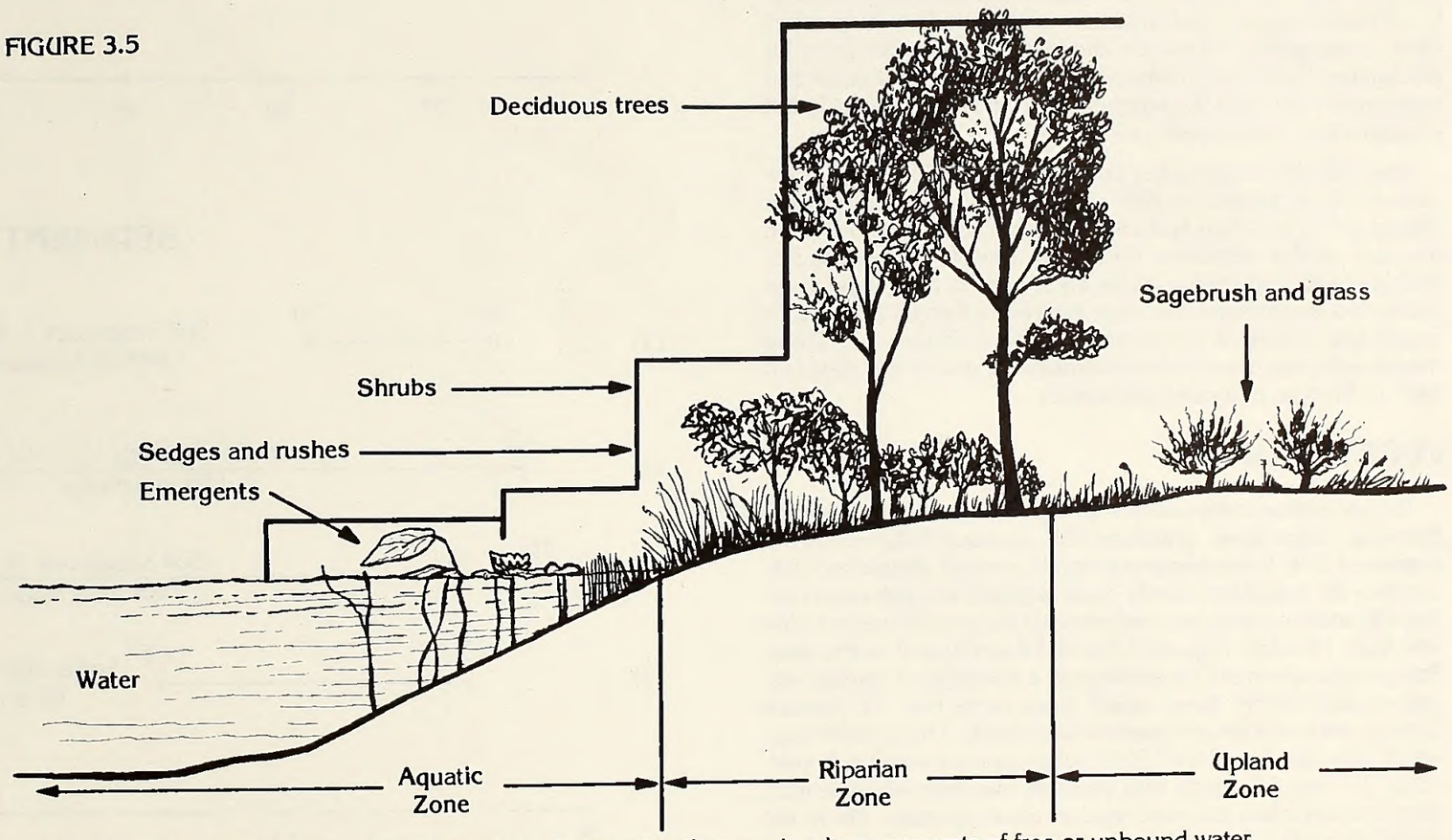
The opportunity for improving range conditions and production with grazing management is greatest on clayey and/or loamy sedimentary uplands, alluvial terraces and floodplains. Grazing systems that are designed to provide for the needs of the vegetation would generally improve range condition in a relatively short time.

Range sites vary widely in production because of differences in soils. Silty and clayey are the dominant range sites and are among the more productive and responsive sites.

Vegetation production on rangelands varies widely with fluctuations in precipitation. Timing of precipitation is critical. Production is lower than normal when precipitation is low or when precipitation occurs during plant dormancy periods. Critical rainfall periods are in the fall before freeze-up and in the spring during early plant growth of the dominant cool season grasses.

Actual use, utilization and trend data has been collected on the 30 existing AMP allotments. Methods of determining trend include photo-trend plots, point transects, comparison of recur-

FIGURE 3.5



Riparian zones are identified by the presence of vegetation that requires large amounts of free or unbound water.

From: Thomas, J.W.; Maser, C.; and Rodier, J.E. 1979. Riparian zones in managed rangelands — their importance to wildlife. *In* Forum — Grazing and Riparian/Stream Ecosystems. Ed. Oliver B. Cope, Trout Unlimited.

rent surveys and professional judgment. Trend information on these allotments is found in Appendix 3.7.

Generally, trend is in a stable or slightly upward direction as indicated by comparison of several range surveys which cover the same area and is evidenced by the preponderance of good or better condition range lands. Those areas in less than good condition are generally the result of several factors such as prairie dogs, livestock concentration areas, or noxious weeds. Such areas generally are not the result of an overallocation of vegetation, but local overuse.

Leafy spurge is a perennial noxious weed which has created a serious problem by infesting Montana ranges, including public lands. It is generally found in small isolated patches; it spreads rapidly and is extremely difficult to eradicate. Several areas (80 acres) were treated with Tordon beads in 1981 with some apparent success. Repeated treatments would be necessary.

Other noxious weeds in significant amounts are: field bindweed, Canada thistle, cocklebur and knapweeds. An occasional isolated patch of halogeton is found.

Invasion of ranges in excellent condition and displacement of useful forage is common with noxious weeds. They are not limited to disturbed or low condition areas, though these areas favor weed infestation

Vegetation production and range condition are greatly reduced on prairie dog towns. Range condition on prairie dog towns is usually poor, because of the continual clipping of vegetation and the conversion of the plant community to invader and low successional plants.

No rare or endangered plant species are known to exist on public lands in the EIS area. One threatened species, yellowcress (*Roripa calycina*), does occur in the area.

LIVESTOCK

About 708 operators are licensed to graze a total of 253,075 AUMs in the 777 allotments in the EIS area.

Grazing usually begins in April and extends through November on some allotments. For most operations, the total grazing period on public and private lands is April-November, a total of 7 to 8 months. Livestock are generally fed hay and supplements on winter pastures, though grazing is not uncommon during open winter. The overall average dependency upon public lands is about 20 percent, although many operations depend heavily on the public lands, especially during spring and summer.

Cattle ranching is the main livestock enterprise on public lands, encompassing 777 allotments and 243,714 AUMs. Seven thousand sheep graze on 31 of the 777 allotments and use 9,361 AUMs, which is about four percent of the total licensed use on the public lands. Most ranches are one-family or family corporation cow/calf operations.

The availability and quality of water are limiting factors on some allotments.

TABLE 3-2
PUBLIC LAND RANGE CONDITION SUMMARY BY MANAGEMENT STATUS
(Acres and Percent)

	GOOD AND EXCELLENT	FAIR	POOR	UNCLASSIFIED	TAME PASTURE	TOTAL
Existing AMPs	202,024 88.7/17.1/20.1	10,433 4.6/.9/11.2	610 .3/.1/27.5	1,914 .8/.2/9.9	12,795 5.6/1.1/21.3	227,776 100/19.4/--
Proposed AMPs	249,388 84.6/21.2/24.8	35,005 11.9/2.9/37.5	1,052 .4/.1/47.3	771 .3/.1/4.0	8,582 2.9/.7/14.3	294,798 100/25/--
Season & Number & Custodial	548,780 84.2/46.5/54.7	47,277 7.3/4.0/50.7	561 .1/.1/25.2	16,569 2.5/1.4/86.1	38,594 5.9/3.3/64.4	651,781 100/55.3/--
Unallocated	3,869 87.5/.4/.4	553 12.5/.1/.6				4,422 100/.5/--
TOTAL	1,004,061 85.2/--/100	93,268 7.9/--/100	2,223 .2/--/100	19,254 1.6/--/100	59,971 5.1/--/100	1,178,777

1 2 3
XXX/XXX/XXX

1. Percent of each management class in each condition class, i.e., 202,024 divided by 227,776 x 100 = 88.7%.
2. Percent of land in each management and condition class, i.e., 202,024 divided by 1,178,777 x 100 = 17.1%.
3. Percent of condition class by management status, i.e., 202,024 divided by 1,004,341 x 100 = 20.1%.

Thirty AMPs were developed cooperatively between ranchers and BLM prior to June 1975. These AMPs include 19 percent of the public lands in the area. Of the thirty AMPs, three use rest rotation grazing systems, 26 use deferred rotation. One approved AMP has not been implemented. Of the remaining allotments, 63 have been recommended for AMP feasibility studies. The remaining 684 allotments would be evaluated to determine if management changes are necessary.

Range surveys and adjudications in the late 1950s and early 1960s established the current livestock use allocations. Allocations were also made to provide for wildlife populations. (See Table 2-2.)

WILDLIFE

Wildlife habitats in the Big Dry Resource Area include diverse combinations of vegetation, water and topography. A diversity of species and numbers of individuals occupy the area. Riparian zones and woody draws (Figure 3-6) and sagebrush-grasslands are crucial habitats. Riparian areas and wooded drainages are estimated at less than five percent of the public acreage in the EIS area. Wildlife use of riparian and woody draw habitats is disproportionate to their occurrence. Therefore, maintenance and enhancement of those habitats is important because of the relationship between these habitats and their use.

Shrub-grassland and shrub-steppe habitats are important to many wildlife species and absolutely necessary to some. Sagebrush is a key forage and cover for various wildlife, particularly deer, antelope and sage grouse (Bayless 1969, Martin 1970, Schlatterer & Pyrah 1970). Sagebrush vegetation types occupy 21 percent of the EIS area.

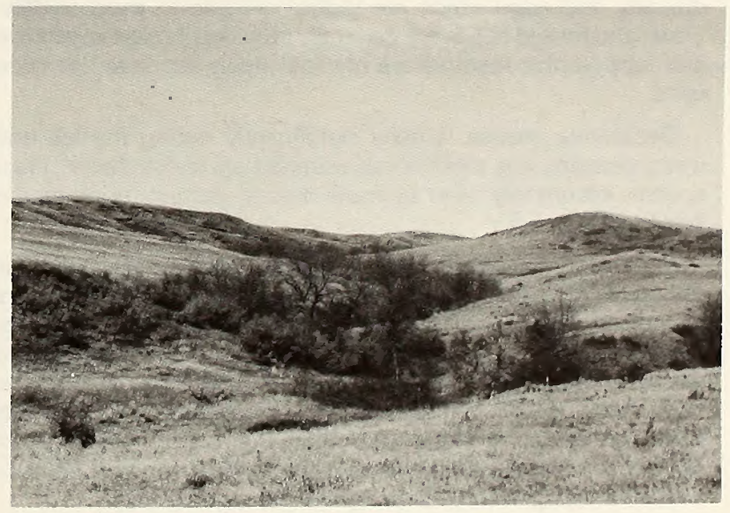


FIGURE 3-6
Woody draw habitat

Crucial big game winter ranges may require special vegetation allocations. Although winter ranges requiring special considerations have not been identified, monitoring would allow management decisions on a case-by-case basis.

Wildlife species known or expected to occur in the Big Dry Resource Area include 58 mammal, 238 bird, 10 reptile, 6 amphibian, and 59 fish. (See URA 2 for Jordan, North Rosebud, Kinsey, Prairie, Baker, Wibaux, Circle, and Richland-Glendive Planning Units.)

The following sections are general discussions of existing wildlife and their habitats. Extrapolations of animal densities to public lands as target management levels and as a basis for vegetation allocations, for the most part, are considered unrealistic and generally not supported by state wildlife personnel. In coordination with the Montana Fish, Wildlife and Parks Department, we recognized that available information prevented quantifications of wildlife for allotment level vegetation allocations. The present situation (75% allocation to nonconsumptive and wildlife uses and 25% to livestock use) affords the best allocation and the best opportunities for monitoring and adjusting allocations to meet special conditions.

BIG GAME

Mule Deer

Mule deer are the most common big game animal of the Big Dry Resource Area. They are distributed throughout the area and utilize, to some degree, most of the public land.

Habitats crucial to mule deer in southeastern Montana are riparian drainages and woody draws, upland shrub complexes (particularly sagebrush), and the various breaks types. Combinations of vegetation and topographic features provide habitat diversity and edge which are highly valuable to most wildlife. Cover and forage needs are generally provided if these vegetative and topographic features are not too widely separated or overused.

Deciduous browse is used significantly during the fall and winter seasons (e.g. rabbitbrush, skunkbrush, chokecherry). Plant species commonly used by mule deer in eastern Montana are listed in Table 3-3.

Mule deer numbers have increased significantly since the spring of 1979. Montana Fish, Wildlife and Parks (FW&P) used a computer model to obtain high and low densities of deer for hunting units within the EIS area. These are not to be considered absolute population estimates, but only represent density estimates for a specific period of time. (See Appendix 3.8 for density estimates of deer and the assumptions and rationale for these estimates.) Densities of mule deer by hunting unit ranged from 1.0 to 12.6 (high estimates) animals per square mile.

Wintering areas in 1977-78 and 1978-79 with five or more deer per square mile are shown on Map 2 (Map Supplement).

TABLE 3-3
PLANTS MOST UTILIZED BY DEER IN MONTANA[1]

Browse[2]	Forbs
Big Sagebrush	Alfalfa
Common juniper	American vetch
Rabbitbrush	Common bastard toadflax
Rose	Common dandelion
Snowberry	Hood's phlox
Chokecherry	Lomatium
Silver Buffaloberry	Prairie onion
Skunkbush sumac	Summer cypress
Willow	Prairiesmoke
Cottonwood	Pussytoes
Silver sagebrush	Sagebrush buttercup
Red-aster dogwood	Scarlet gaura
Serviceberry	Yellow fritillary
Plains poplar	Yellow salsify
Winter fat	Yellow sweetclover
Nuttall saltbush	Prickly lettuce
Creeping juniper	Small soapweed
	American licorice
Grass	Fringed sagewort
Prairie junegrass	Wild buckwheat
Sandberg bluegrass	Clover
Western wheatgrass	Fireweed
Wheat	
Barley	

[1]From Prairie Potholes EIS

[2]Browse, forbs and grasses which are important in Montana deer studies and known to occur in the EIS area

White-tailed Deer

Whitetailed deer densities by hunting unit ranged from 0.1 to 15.6 (high estimates) animals per square mile (Appendix 3.8). Woodlands are preferred habitats of whitetails; and in the Big Dry Resource Area, riparian and woody draw habitats are crucial elements of their range. Plant species found in whitetail diets are listed in Table 3-3.

Winter concentrations with observed densities of five or more deer per square mile are shown on Map 2 (Map Supplement).

Antelope

Pronghorn antelope are the second most numerous big game animals. Densities (minimum counts) by hunting unit ranged from 0.6 to 4.4 animals per square mile on antelope range within the hunting units (Appendix 3.9). Herd composition information indicates good fawn production and survival rates for the area, probably because of suitable habitat conditions on native rangelands (Montana Department of Fish, Wildlife and Parks 1974-79).

Antelope are characteristically plains animals and occupy open, rolling grasslands and shrub-grasslands. Antelope use grassland, grassland-shrub, shrub and agricultural vegetation types in the spring, summer and early fall while they concentrate on grassland-shrub and shrub types during the winter.

Browse is vital in the antelope diet; sagebrush constitutes a very large part of their yearlong forage (Table 3-4). Winter diet usually consists of at least 80 percent sagebrush. In the spring, succulent green grasses are used for 1 to 2 weeks before forbs are available. Also important in the spring, summer and early fall are seasonal forbs. Plants more commonly used by antelope in central Montana are listed by season of use in Table 3-5. Similar patterns of food usage are assumed in eastern Montana.

General antelope winter ranges have been delineated by the Montana Fish, Wildlife and Parks Department (Map 4, Map Supplement). Crucial wintering areas have not been delineated for the entire EIS area. Crucial winter habitat includes sagebrush and shrubs between 12 to 24 inches in height, especially when snow covers the shorter sagebrush plants. Vegetation cover is also necessary for fawning as it protects the young from predators and severe winters (Autenrieth 1978).

TABLE 3-4
PLANTS MOST UTILIZED BY PRONGHORN ANTELOPE IN MONTANA[1]

Browse[2]	Forbs
Big sagebrush	Common bastard toadflax
Silver sagebrush	Western yarrow
Greasewood	Hairy seed lomatium
Winterfat	Hood's phlox
Rabbitbrush	Knotweed
Rose	Cudweed sagewort
Skunkbrush sumac	Fringed sagewort
Western snowberry	Scarlet glovemallow
Nuttall saltbush	Silver scurfpea
	Small soapweed
Grass	Yellow sweetclover
	Thistle (all species)
Bluegrass	Onion
Wheat	Sagebrush buttercup
Barley	Wavyleaf agoseris
Blue grama	Yellow salsify
Brome grass	Alfalfa
Wheatgrass	Aster
Common dandelion	Field bindweed
Prairie clover	Prickly lettuce

[1]From Prairie Potholes EIS

[2]Browse, forbs, and grasses which are important in Montana antelope studies and known to occur in the EIS area

TABLE 3-5
FOOD HABITS OF PRONGHORN ANTELOPE FOR EACH SEASON OF THE YEAR IN CENTRAL MONTANA[1]

Season	Seasonal Preference First	Second	Third
Spring	Browse (71%)	Forbs (21%)	Grass (8%)
Summer	Forbs (66%)	Browse (33%)	Grass (1%)
Fall	Browse (50%)	Forbs (48%)	Grass (2%)
Winter	Browse (98%)	Grass (1.5%)	Forbs (0.5%)

[1]From Prairie Potholes EIS

Bighorn Sheep

Bighorns (the Audubon variety) in early history were an inhabitant of the Northern Great Plains area. Badlands and rugged river breaks were topographically suited to their cover needs. They have been reintroduced to the breaks along the Powder River; other reintroductions may be feasible particularly in the Terry Badlands.

UPLAND GAME BIRDS

Sharp-tailed Grouse

Sharp-tailed grouse are the most common upland game birds. Because of their general distribution, they are considered as occurring over the total 1,178,777 acres of public lands. They are widely distributed through the grassland, grassland-shrub and open woodland habitats. Woody draws associated with these types are particularly important yearlong because of their food and cover values.

Yearlong residual cover is very important for the sharp-tailed grouse. Adequate nesting cover is 4 to 6 inches of grass, which also provides security during the brood-rearing seasons. Brood rearing takes place in the same area as nesting. Woody draws in the woodlands, grassland and grassland-shrub habitats are crucial brood-rearing areas.

Important plant species used by sharp-tailed grouse are alfalfa, clover, common chokecherry, common dandelion, pussytoes, rose, serviceberry and silver buffaloberry (Marshall et al. 1937, Martin et al. 1951, and Neilsen 1978).

Buffaloberry, snowberry, juniper and wild rose in the woodlands are used extensively for food and cover by grouse during the winter. If snow is not available for burrowing during severe winter weather, shrubby vegetation must be available to protect the grouse population from heavy winter kills. Studies show that grouse may move some distance to find these shrubs (Neilsen 1978). Maintenance of woody draws and riparian habitats is the key to winter survival of sharp-tailed grouse.

Sage Grouse

Sage grouse are the next most important game birds, having about 247,500 acres of habitat on public lands. They are primarily associated with the big and silver sagebrush communities in grassland-shrub and shrub vegetation types. Populations seem to be decreasing because of the continual reduction in habitat, principally due to expanding cultivation (Martin, personal communication). Distribution of sage grouse in the area is illustrated on URA map overlays in the Big Dry Resource Area Office.

Nesting habitat is located under sagebrush, usually within 2 miles of mating grounds (Wallestad and Pyrah 1974, Martin 1970, and Gill 1965).

Sage grouse wintering/nesting complexes should be managed to sustain a sagebrush component of 15 to 30% canopy coverage and an average plant height of 18 inches.

Ring-Necked Pheasant

Pheasants are commonly associated with riparian/agriculture vegetative associations. A small amount of public land is found on the riparian zones (less than 5%). Those acres of public riparian habitat are important areas of cover.

Turkeys

Turkeys occur most commonly in riparian habitats of major drainages in the EIS area and in the Ponderosa pine habitats of the Knowlton/Locate area.

WATERFOWL

The Canada goose and 19 species of ducks are found in the EIS area (URA 2 for planning units). In addition to the Canada goose, common nesting species are the mallard, pintail, blue-winged teal, green-winged teal, and American wigeon.

The northern portion of the Big Dry area is part of the larger continental potholes region (300,000 square miles), the most important waterfowl producing area in North America (Smith et al. 1964). In wet years, this total area has the potential of producing over half of the annual duck population in North America, while containing only 10 percent of the duck breeding area. Water is the limiting factor in duck production.

The Yellowstone and Missouri Rivers are prime waterfowl areas. Canada goose production on the Yellowstone River and in the general Sunday Creek area is significant and increasing. Stock-watering reservoirs in the Big Dry Resource Area also contribute to waterfowl production and migration.

Livestock tend to periodically concentrate around water sources, resulting in depletion of vegetative cover.

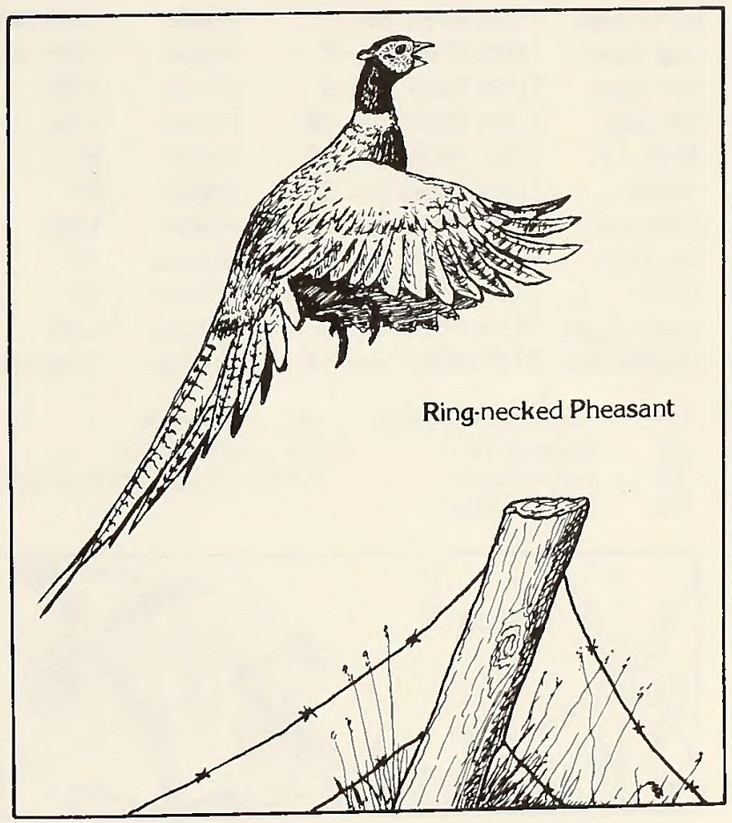
NONGAME ANIMALS

Mink, beaver and muskrat are the principal fur bearers harvested in the area. All three are associated with water habitat. Predators that might be observed on public lands are the coyote, fox, weasel, badger, skunk, bobcat and raccoon.

Numerous nongame birds occupy various habitats on public lands. Some are specific to a particular habitat type, with the highest densities occurring in riparian ecosystems (BLM, Nongame Studies, 1980). Almost all are seasonal and leave the area during winter.

There are approximately 2900 acres of known black-tailed prairie dog towns in the EIS area. Prairie dog towns provide habitat that may be used by more than 30 animal species. The burrowing owl and mountain plover, species of special concern to the Montana Department of Fish, Wildlife and Parks (1979) may be found in these towns. Potential habitat for the endangered black-footed ferret also exists in these towns.

Prairie dogs compete with livestock for forage. In the past, prairie dog towns covered thousands of acres in the area and were reduced or eliminated by local ranchers through control programs. Prairie dog expansion on public lands may seriously reduce the forage available to livestock. In response to this concern, BLM in Montana has formulated a prairie dog policy statement (Appendix 2.6) to guide prairie dog management on public lands.


Ring-necked Pheasant

FISHERIES

Sport fisheries occur in the Yellowstone, Missouri and Redwater Rivers. Tributary streams in the area that support sport fisheries are Fox Creek, Big Dry Creek, Little Dry Creek and Beaver Creek.

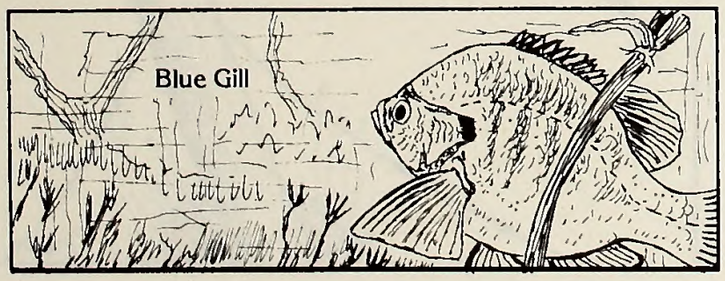
Nongame fisheries are supported in the above waters as well as in persistent pools of ephemeral streams. Public lands provide some access to sport fishing streams in the area. Fish species are listed in the URA 2 for planning units within the EIS area.

Reservoirs on public lands may also provide fishing opportunities. Public reservoirs that are periodically stocked with fish are listed in Table 3-6.

TABLE 3-6
RESERVOIRS PERIODICALLY STOCKED AND WITH PUBLIC ACCESS ON BLM ADMINISTERED LANDS

	LOCATION		
Reservoir	Legal Descrip.	Planning Unit	Fisheries[1]
Gunderson	T8N, R59E, Sec. 24	Baker	LMB
Crawford	T8N, R61E, Sec. 22	Baker	LMB
Clark	T13N, R48E, Sec. 18	Prairie	RT, YP
South Fork	T13N, R48E, Sec. 17	Prairie	LMB, BG
Grants	T13N, R48E, Sec. 21	Prairie	BL
Silvertip	T13N, R48E, Sec. 24	Prairie	LMB
Homestead	T14N, R49E, Sec. 7	Prairie	LMB, SMB
Coal Creek	T13N, R51E, Sec. 35	Prairie	LMB, GS
Ole Olson	T10N, R52E, Sec. 5	Prairie	LMB
Bill Almy	T10N, R54E, Sec. 28	Prairie	LMB
Ayers #3	T10N, R55E, Sec. 10	Prairie	RT
Harms	T13N, R48E, Sec. 31	Prairie	RT
Cottontail	T13N, R48E, Sec. 33	Prairie	LMB
Big Drop	T13N, R56E, Sec. 9	Wibaux	RT
Camp	T13N, R56E, Sec. 9	Wibaux	RT
Prairie Goat	T13N, R56E, Sec. 9	Wibaux	LMB
Upper Labell	T13N, R56E, Sec. 14	Wibaux	Potential

[1]LMB — Large-mouthed Bass
RT — Rainbow Trout
YP — Yellow Perch
GS — Green Sunfish
BG — Bluegill
BL — Bullhead
SMB — Small-mouthed Bass



ENDANGERED AND THREATENED SPECIES

The bald eagle is the only endangered species known to occur in the area.

Potential for black-footed ferret occurrence exists with prairie dog towns. A confirmed sighting of a black-footed ferret was made on a prairie dog town south of the EIS area in Carter County in 1978.

Infrequent sightings of peregrine falcons in migration have occurred in the area.

RECREATION AND WILDERNESS

Recreation

Within the EIS area, the Bureau administers 14% of the surface property. Although the Bureau manages a small fraction of the land base, the importance of public land to the sportsman should not be underrated. As local populations expand in eastern Montana (due to energy development), the Bureau anticipates increased pressure on public land.

The most popular recreational activities are hunting and driving for pleasure. Other recreation activities include fishing, ORV use (mainly associated with hunting), collecting (agates and fossils), varmint hunting, camping, hiking and water sports (along the Yellowstone and Missouri Rivers).

Wilderness

The wilderness inventory has been completed in accordance with Section 603(a) of the Federal Land Policy and Management Act (FLPMA). Two units, Terry Badlands (MT-024-684) and Musselshell Breaks (MT-024-677), have been identified as Wilderness Study Areas (WSA) (Map 1, Map Supplement). Both areas possess the necessary characteristics of size, naturalness and outstanding opportunity for solitude and/or primitive and unconfined recreation to qualify them for further study.

The Terry Badlands and Musselshell Breaks units (Table 3.7) will be evaluated to consider all multiple use values in determining suitability for preservation as wilderness. Until the planning process is complete and a final determination on the wilderness suitability is made, both areas will be managed under the Interim Management Policy and Guidelines for Lands under Wilderness Review (IMP) (December 1979). The IMP states that the grazing use authorized during the 1976 grazing fee year is "grandfathered" and may continue. Range developments existing or under construction as of passage of FLPMA (October 22, 1976) may continue to be used and maintained. New range improvements and/or changes in grazing levels or seasons of use will be allowed only if the action is found to be consistent with the IMP.

TABLE 3-7
SUMMARY OF WILDERNESS STUDY AREAS

	Terry Badlands		Musselshell Breaks	
Unit Number	MT-024-684		MT-024-677	
Acreage	44,515		8,050	
Allotments Affected	Haughian Lvst.	— 2747	Gordon Dockery	— 6372
	Reukauf	— 2780	Carl Peterson	— 6775
	Hines	— 2750	Rowtan, L. & V.	— 6377
	C.M. Coffee-Nefsy	— 2772		

CULTURAL RESOURCES

The cultural environment of the Big Dry EIS area includes the remnants of prehistoric and historic human residence during the past 12,000 years. Evidence of habitation, economic survival, social ceremony and art occur across the area.

More than 80 percent of prehistoric sites are either lithic scatters or stone circle (tipi ring) sites. The remaining sites are bison or other animal kill sites, associated cairns and stone alignments, other kinds of human habitation sites, rock art and burials.

Of the historic properties inventoried to date, the vast majority are abandoned homesteads. These are characterized by foundations or foundation pits, agricultural equipment, debris and structures occasionally left standing.

The amount of public land in the Big Dry EIS area (1,178,777 acres), precluded a comprehensive survey to determine all historic and cultural properties that might be eligible for inclusion in the National Register of Historic Places. BLM has completed an existing data (Class I) inventory of the entire area, however, and identified no properties that are included in the National Register and fewer than 50 that appear to meet the criteria for inclusion in the National Register. Future inventory can be predicted to identify more National Register quality sites.

The cultural site inventory for public lands in the area is approximately 2 percent completed. About 150 sites (most of which are prehistoric) have been recorded. Available sampling inventory data on about 5 percent of the area indicates a density of 1.5 to 5 sites per 640 acres. Site density varies, however, according to the general terrain and environment type. Some environmental zones in the study area have not been adequately surveyed to accurately predict site occurrence. The existing data does offer reasonable understanding of the kinds of cultural properties likely to be encountered (Table 3-8).

TABLE 3-8
CULTURAL RESOURCES IN THE EIS AREA

Cultural Period	Cultural Evidence
Paleo-Indian (10,000 - 6,000 B.C.)	stone tools camp sites
Early and Middle	bison traps
Plains Archaic (6,000 - 1,000 B.C.)	camp sites bone debris
Late Plains Archaic (1,000 B.C. - 500 A.D.)	bison traps and pounds stone tools tipi rings fire-broken rock bone debris rock alignments
Late Prehistoric (500 - 1,800 A.D.)	stone tools tipi rings cairns rock alignments buffalo jumps and kill sites rock art
Early Historic (1800 - 1890)	camp sites habitations military sites other structures
Late Historic (1890 -)	early ranching remnants homesteading remnants tools, equipment, debris schools, churches, cemeteries other structures

SOCIAL AND ECONOMIC CONDITIONS

Introduction

The Big Dry EIS area encompasses most of a ten county region. Data limitations prevent the subdivision of counties into smaller units which would more closely reflect the EIS boundaries. All of Dawson, Fallon, Richland, Prairie and Wibaux and portions of Garfield, Rosebud, Custer, McCone and Carter Counties are in the EIS area.

The EIS area is a sparsely settled region (2.3 people per square mile) which showed a population growth rate of 7% during the 1970s. This was a slightly lower rate than the state average for the decade (Table 3-9). Most of the growth in the region occurred in Richland County in the late 1970s, when energy-related development in the county began to flourish. Between the years 1960-70, sizeable population declines were recorded due to out-migration.

In 1980 the entire EIS area contained 4.5 percent of Montana's total population. Projections for 1985 and 2000 have populations slightly declining.

In the study area the proportions of population classified as rural, nonfarm declined during the years 1960-1980 (Table 3-9). The proportion increased for urban and rural farm from 1960-80.

Sidney (in Richland County) with a 1980 population of 5,723, and Glendive (Dawson County) with a population of 6,031 are the major trade and service centers. All other towns have populations of under 2,500 people (Table 3-9). Sidney grew by 26 percent during the decade 1970-80 while Glendive lost 4 percent of its population during the same period.

Ranch Related Economic Conditions

Ranch Operations and Related Income

There are currently 708 individual ranch operations with permits to graze public lands. In addition, many ranches are permitted to graze public lands through grazing associations. Where possible, the larger associations have been divided according to share holdings and AUMs assigned to the individual operator; these operations are included in the 708 total. Operations included in the cooperative state grazing districts are permitted on an individual basis and are also included in the individual operations.

Ranch operations with BLM permits comprise approximately 30 percent of the total ranches in the nine-county area. One hundred of the 708 operations have permits for fewer than 25 public AUMs. The dependency of these hundred operations on forage from public lands and the potential impact of grazing adjustments on their operations is not considered significant. Therefore, this analysis concentrates on the remaining 608 operations (see Appendix 3.10).

These 608 ranch operations were placed into 12 categories according to the number of livestock and the acres of cash crops raised. (See Table 3-10.) Although there are a few operations that raise sheep and yearlings, the predominant type of ranch is a cow/calf operation. Where sheep, horses or yearlings are involved, the total number has been converted to equivalent cow units. Over 80 percent of the ranches fall into the 6 small and medium livestock categories, and over 54 percent grow medium or large sized acreages of cash crops.

Dependence of ranch operations on public forage is determined by a combination of several factors: the percentage of the total required forage that public lands provide, the seasons the forage is available and the availability of substitutes for this forage. The percentage is the primary indicator; Table 3-10 shows the average dependency according to ranch size categories. Eighty-nine ranches (14%) are from 41-80 percent dependent on forage from public lands for their total grazing requirement. The average ranch is about 20 percent dependent.

Table 3-11 shows that the 608 farms/ranches generate $13,336,306 annually in returns above cash cost and depreciation. This is the amount available to the operators and their families for their labor and management and their return to their equity capital. Sixty-seven percent of this ($8,892,655) is from the livestock portion of the operations. Gross livestock sales from these 608 ranches is approximately $51,847,000. Returns per

TABLE 3-9
POPULATION CHARACTERISTICS

	EIS Area	State of Montana
1980 Population[1]	35,212	783,698
Population Change 1970-1980[1,2]	+7%	+13%
Population Change 1960-1970[2]	-9%	+3%
Net Migration Rate 1970-1977[3]	-5%	+4%
Net Migration Rate 1960-1970[4]	-20%	-9%
Projected Population 1985[5]	33,300	823,100
Projected Population 2000[5]	32,500	935,600
Density (persons/sq. mi.) 1980[1,6]	2.3	5.3
Urban Pop. 1980 (% of total)[1,8]	+33%	—
Urban Pop. 1960 (% of total)[2,8]	+32%	—
Rural Non-Farm Pop. 1980 (% of total)[1,9]	+10%	—
Rural Non-Farm Pop. 1960 (% of total)[2,9]	+16%	—
Rural Farm Pop. 1980 (% of total)[1,10]	+57%	—
Rural Farm Pop. 1960 (% of total)[2,10]	+52%	—
Number of Farms, Ranches 1969-1978	-8.9%	-1.8%
Avg. Size of Farms, Ranches 1969-1978	+2.5%	+0.8%

Population of Incorporated Places of 1,000 Persons or More

	Baker (Fallon)	Sidney (Richland)	Fairview (Richland)	Glendive (Dawson)
1980 Population[4]	2,357	5,723	1,351	6,031
Change 1970-1980[4,7]	-9%	+26%	+41%	-4%

Total EIS area includes: all of Dawson, Fallon, Richland, Prairie, Wibaux, and portions of McCone, Garfield, Rosebud, Carter and Custer Counties

[1]1980 Census of Population and Housing - Preliminary Report, PHC8-P-28, Census Bureau, US Dept. of Commerce, December 1980.

[2]1970 Census of Population - Advance Report, PC(V1)-28, Census Bureau, US Dept. of Commerce, September 1970.

[3]US Bureau of Census, Estimates of the Population, Series P-26, US Dept. of Commerce, 1976.

[4]County Profiles, MT Dept. of Comm. Affairs, Research Information Systems, April 1978.

[5]MT Population Projections 1980-2000, Research & Information Systems Division, Dept. of Community Affairs, July 1978.

[6]Lower Yellowstone Area Socioeconomic Analysis, Centaur Management Consultants, May 1978, P. 9.

[7]Census of Agriculture, US Dept. of Commerce, Census Bureau, 1974 and 1980.

[8]Urban classification includes incorporated communities of 2,500 or more population.

[9]Rural nonfarm includes incorporated communities of 1,000 to 2,500 population.

[10]Rural farm classification includes unincorporated communities of less than 1,000 and farms and ranches.

farm/ranch were estimated by formulating a budget for a representative farm/ranch for each of the 12 type and size categories (Appendix 3.10). Returns for each farm/ranch were then aggregated to determine total amounts.

On the basis of 1977-79 average prices, the representative farm/ranch in each size and type category earns enough income to at least cover cash costs and depreciation (Table 3-11). Returns of $6,810 annually for the small livestock/small cash crop operation are not enough to pay the operator minimal wages. Also there is no return to equity capital. Some of these ranch operators and their families are employed off the ranch to supplement their incomes. If they do not have off-ranch employment and the returns are not enough to cover family living expenses, then they usually allocate funds from the depreciation allowance, at least in the short run. If this happens, the operators must live with deteriorating equipment and without improvements and borrow on their equity when replacement becomes unavoidable.

Based on the ranch budgets, it is estimated that the equivalent of one work year of hired labor is required for every 250 cows. Thus, livestock-related employment for the 608 farms/ranches in the EIS area is estimated to be the equivalent of 363 full time employees.

Permit Value

The BLM does not recognize the right of the permittee to treat grazing permits as real property. These permits do have value, though, and are bought and sold in the marketplace and used as collateral for loans (McConnen 1976). The value of the permits vary considerably. If the permit is for small isolated, landlocked tracts of public lands, then the value is minor. Where public lands provide a large block of grazing, the permit value can be substantial. Permit value is difficult to estimate because it usually is not separated from the total value of the ranch. Also, ranches are usually valued and sold on a cow-unit basis. It is estimated that an average value for BLM grazing permits is approximately $100 per AUM or $1,200 per animal unit.

Total value for BLM grazing permits of the 608 farms/ranches is approximately $24,614,800. (The value of permits for operations with fewer than 25 BLM AUMs and some smaller grazing associations is not included in this figure.) The 58 very large livestock/small cash crop farms/ranches have the highest total permit value, $4,814,000.

TABLE 3-10
ESTIMATED CURRENT DEPENDENCY OF RANCHES ON BLM GRAZING

Farm/Ranch Size Category	Category #	Category %	Avg. Herd Size (Cow Units)	0-20%	21-40%	41-60%	61-80%	Avg. % Dependency
Small Livestock & Small Cash Crop (0-150 cows; 0-25 acres cash crop)	140	(23.0%)	100	77 (55%)	36 (26%)	11 (8%)	16 (11%)	24.4
Small Livestock & Medium Cash Crop (0-150 cows; 26-500 acres cash crop)	124	(20.4%)	100	78 (63%)	27 (22%)	17 (14%)	2 (1%)	23.4
Small Livestock & Large Cash Crop (0-150 cows; 500+ acres cash crop)	36	(5.9%)	100	15 (42%)	9 (25%)	7 (19%)	5 (14%)	31.1
Medium Livestock & Small Cash Crop (151-375 cows; 0-25 acres cash crop)	104	(17.1%)	250	79 (76%)	13 (13%)	11 (10%)	1 (1%)	15.1
Medium Livestock & Medium Cash Crop (151-375 cows; 26-500 acres cash crop)	62	(10.2%)	250	39 (63%)	13 (21%)	8 (13%)	2 (3%)	19.5
Medium Livestock & Large Cash Crop (151-375 cows; 500+ acres cash crop)	27	(4.4%)	250	25 (93%)	2 (7%)	0 (0%)	0 (0%)	9.0
Large Livestock & Small Cash Crop (376-749 cows; 0-25 acres cash crop)	58	(9.6%)	500	47 (81%)	5 (8%)	5 (8%)	1 (2%)	15.6
Large Livestock & Medium Cash Crop (376-749 cows; 26-500 acres cash crop)	17	(2.8%)	500	12 (70%)	2 (12%)	2 (12%)	1 (6%)	14.4
Large Livestock & Large Cash Crop (376-749 cows; 500+ acres cash crop)	6	(1.0%)	500	6 (100%)	0 (0%)	0 (0%)	0 (0%)	4.0
Very Large Livestock & Small Cash Crop (750+ cows; 0-25 acres cash crop)	29	(4.8%)	1500	25 (86%)	4 (14%)	0 (0%)	0 (0%)	11.0
Very Large Livestock & Medium Cash Crop (750+ cows; 26-500 acres cash crop)	3	(.5%)	1500	2 (67%)	1 (33%)	0 (0%)	0 (0%)	16.0
Very Large Livestock & Large Cash Crop (750+ cows; 500+ acres cash crop)	2	(.3%)	1500	1 (50%)	1 (50%)	0 (0%)	0 (0%)	21.7
TOTAL	608	(100 %)						

Source: BLM 1981

Social Conditions

In July and August of 1981, a BLM sociologist conducted a series of informal telephone interviews with 61 ranchers in the resource area (8% of total area operators). Highlights of those interviews, supplemented by written comments gathered during the MFP public participation process, were used to develop this section. For an explanation of the methodology used, see Appendix 3.11.

The average age of ranchers interviewed was 56 years. This is slightly higher than the average age of area operators (50.1 years) reported in the 1978 Census of Agriculture for the nine-county study area. The median number of school years completed by operators surveyed was 11 years, with 10 ranchers indicating they had at least some college background.

All but two of the ranchers interviewed have lived in the resource area for five years or more. Length of family tenure in the district varied from 3 to 91 years with most of those interviewed stating that their families had settled in the area around the turn of the century. Most of their spouses were also born and raised on ranches, usually somewhere within or near the resource area.

Fifty-nine of the respondents reported that they presently own or are in the process of buying the ranch which they are working. Ninety-five percent of the respondents identified ranching as their primary occupation. Very few of those interviewed reported that they or immediate members of their families have outside employment or income sources other than ranching although many seemed to think a second source of income is a necessity for anyone starting out in the livestock business today.

Historically the resource area has been dominated by agriculture which has done much to shape both the economic and social structure of the area. The prevailing lifestyle is strongly tied to the land, to a sense of independence, self-reliance and stability characteristic of rural areas.

Ranchers interviewed generally placed a high value on the lifestyle associated with ranching, although they stated repeatedly that it is rarely a lucrative business for the small operator. Attributes of the lifestyle which they found to be particularly appealing were the opportunity to be their own boss, the ability to work out-of-doors, the challenging nature of the work and the relative isolation of the ranch. Oftentimes the ranch was mentioned as an

attractive and healthy place to raise a family. Children are assumed to learn at any early age to accept responsibility and to develop a respect for the land and for nature. Many respondents noted, however, that their reasons for being in the ranching business were simply pragmatic: they were born and raised on ranches, it is the only life they know and the only one they feel they can comfortably live with.

Only a few ranchers interviewed gave economic reasons for being in the livestock business. To most ranchers, economics appeared to be more a barrier to continuation in or entry into the ranching industry than it was a reason for being there. Escalating operating costs and low cattle and wheat prices were often mentioned as confounding operators' attempts to make a living off the land. Burgeoning government regulations and interference from "environmentalists" were also commonly seen as threats to the continued viability of the ranching industry.

The fact that the average age of area ranchers is so high would seem to indicate that some major turnover in ranch ownership is likely to occur in the area in the future. Most ranchers interviewed expressed a desire to see their children take over their operation one day, although quite a few respondents felt that it is becoming increasingly harder for young people to get started in the business without some type of financial help. Higher wages and better working conditions available elsewhere were seen as attracting a lot of young people away from the ranching business. The future trend in the area according to some ranchers is that big operators are going to get bigger, as only agribusinesses are assumed to be financially capable of buying land as it becomes available.

Almost all of the ranchers interviewed felt strongly that livestock should have dominant use of public lands, based not only on historic use patterns, but also on the belief that the best use of the land is the most productive one. World food shortages and the importance of red meat production to the social and economic well-being of both local and national populations were also mentioned as reasons why the livestock industry should be protected and encouraged. Also, because of their dependence on public lands to supplement the forage on their private property, many ranchers would face added economic difficulties if use of public lands were withdrawn.

Most respondents believe that, as long-time users of the land, local ranchers are in the best position to judge the overall quality of the range. In the same vein, it is felt by some that the BLM has unrealistic expectations of the land's productivity. Most operators concurred that the present condition of public rangelands in the Big Dry area is satisfactory, given the vagaries of the weather and the natural limitations of the land itself. The majority of respondents felt that, as a class, ranchers would not purposely jeopardize the land by overgrazing it as their economic future is dependent on the continued health of the range. Almost all ranchers interviewed reported that they tend to treat public lands as their own. Some respondents reported that they often do not take advantage of their full grazing privileges in years of poor rainfall.

It was the opinion of almost all respondents, however, that BLM should take positive action to improve range conditions where needed. More range improvements would, it was felt, benefit both livestock and wildlife on public lands by increasing the production of vegetation on the range and by leading to better distribution of grazing use. Several ranchers reported repeated frustration in the past in their attempts to get needed range improvements, particularly water developments, constructed on their allotments.

Almost all respondents felt grazing was compatible with multiple use of public lands and emphasized the effectiveness of cattle as management tools on the public range. The general sentiment of those interviewed was that multiple use is already a reality on public rangelands in the area with use of the land well balanced between livestock, wildlife and recreation. Many ranchers commented that numbers of game and nongame animals in the area have appeared to stabilize or even increase over the years, partly because large numbers of deer and antelope are regularly allowed to feed on deeded lands in the region.

Hunting and other recreation use of public lands in the resource area has apparently caused some conflict with grazing in the past as approximately one-third of the ranchers interviewed stated they have had problems with recreationalists entering private land without permission, driving vehicles over pastures, litter-

TABLE 3-11
ESTIMATED CURRENT RANCH INCOME BY RANCH SIZE

						Returns Above Cash Cost and Depreciation				
Farm/Ranch Size Category	No. of Cows	No. of Acres of Cash Crop[1]	Average of BLM AUMs per Ranch	No. of Farms/ Ranches	Gross Sales Livestock Enterprise All Ranches	Livestock Enterprise Average Per Ranch	Livestock Enterprise All Ranches	Cash Crop Enterprise Average Per Farm	Livestock & Cash Crop Enterprise Average per Farm/Ranch	Total All Farms/ Ranches
Small Livestock-Small Cash Crop	0-150	0-25	179	140	$4,301,360	$6,802	$952,280	$8	$6,810	$953,414
Small Livestock-Medium Cash Crop	0-150	26-500	179	124	3,809,776	6,802	843,448	8,451	15,253	1,891,432
Small Livestock-Large Cash Crop	0-150	500 or more	179	36	1,106,064	6,802	244,872	32,941	39,743	1,430,750
Medium Livestock-Small Cash Crop	151-374	0-25	396	104	8,073,936	15,001	1,560,104	13	15,014	1,561,450
Medium Livestock-Medium Cash Crop	151-374	26-500	396	62	4,813,308	15,001	930,062	8,209	23,210	1,439,014
Medium Livestock-Large Cash Crop	151-374	500 or more	396	27	2,096,118	15,001	405,027	37,514	52,515	1,417,900
Large Livestock-Small Cash Crop	375-749	0-25	830	58	8,988,840	26,458	1,534,564	12	26,470	1,535,237
Large Livestock-Medium Cash Crop	375-749	26-500	830	17	2,634,660	26,458	449,786	7,943	34,401	584,810
Large Livestock-Large Cash Crop	375-749	500 or more	830	6	929,880	26,458	158,748	49,360	75,818	454,907
Very Large Livestock-Small Cash Crop	750 or more	0-25	1435	29	12,873,390	53,346	1,547,034	28	53,374	1,547,849
Very Large Livestock-Medium Cash Crop	750 or more	26-500	1435	3	1,331,730	53,346	160,038	5,633	58,979	176,938
Very Large Livestock-Large Cash Crop	750 or more	500 or more	1435	2	887,820	53,246	106,692	40,532	98,878	187,756
TOTAL				608	$51,846,882		$8,892,655			$13,336,306

[1]Average acres harvested annually does not include summer fallow

Sources: BLM 1981, ASCS 1981 USDA-ERS 1981

ing and leaving cattle gates open. Some area ranchers have suggested that hunters and other users of public lands be required to pay a small fee for range improvements that increase the carrying capacity of the land for wildlife, much as ranchers are required to do for livestock. Multiple use, they believe, should mean "multiple responsibility". The majority of respondents see little conflict between recreation use and grazing on public lands, however.

Most of the ranchers interviewed expressed satisfaction with the job being done by the BLM in their range management programs in the area and report a good working relationship with the agency. Over one-half of the ranchers mentioned they have only limited or very minimal contact with BLM personnel. Concern was often expressed by respondents, however, about the proliferation of government regulations and paperwork that has handcuffed ranchers and local BLM officials in the past and made it hard to get things done. A few ranchers also expressed dissatisfaction with what is viewed as BLM's extreme dependence on "the books", which fails to give due recognition to ranchers' working knowledge of the range.

Regional Economic Conditions

Earnings and Employment

Figures for 1978 show sources of employment and earnings for the study area (Tables 3-12, 3-13 and Appendix 3.12). Total employment in the study area was approximately 17,600. Total income was approximately 175 million dollars. Agriculture, government, retail trade, services, transportation and public utilities contribute approximately two-thirds of employment and earnings. Glendive and Sidney serve as major trade and service centers for the region.

TABLE 3-12
STUDY AREA EMPLOYMENT BY SOURCE FOR 1978
(NUMBER AND PERCENT OF TOTAL)

Source	1978 Number	Percent
Proprietors		
Agriculture	2,609	14.8
Non-Agriculture	1,477	8.4
Wage & Salary		
Agriculture	747	4.2
Ag. Services, Forestry, Fisheries & Other	181[1]	1.0[2]
Mining	940[1]	5.3[2]
Construction	824[1]	4.7[2]
Manufacturing	498[1]	2.8[1]
Transportation and Public Facilities	1,557[1]	8.9[2]
Wholesale Trade	729	4.1
Retail Trade	2,159	12.2
Financial Institutions and Real Estate	395[1]	2.2[2]
Services	2,097	11.9
Government[3]	2,818	16.0
TOTAL	17,631	100.0

The data is derived from Dawson, Fallon, Garfield, McCone, Prairie, Richland, and Wibaux County data.

[1] Data for one, two or three counties are missing because it was not disclosed; thus study area total for that sector is underestimated. Missing data is included in the totals.

[2] Percent is underestimated because of missing information (see 1.)

[3] Figure includes local, state and federal government employees.

SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis, 1980.

TABLE 3-13
STUDY AREA EARNINGS BY SOURCE FOR 1978
(THOUSANDS OF DOLLARS)
(NUMBER AND PERCENT OF TOTAL)

Source	1978 Number	Percent
Agriculture	26,600	15.2
Ag. Services, Forestry, Fisheries & Other	1,021[1]	.6[2]
Mining	21,052[1]	12.0[2]
Construction	13,318[1]	7.6[2]
Manufacturing	6,051[1]	3.5[2]
Transportation and Public Facilities	32,229[1]	18.4[2]
Wholesale Trade	9,421	5.4
Retail Trade	16,787	9.6
Financial Institutions and Real Estate	6,148[1]	3.5[2]
Services	16,942	9.7
Government[3]	22,414	12.8
TOTAL	174,888	100.0

The data is derived from Dawson, Fallon, Garfield, McCone, Prairie, Richland, and Wibaux County data.

[1] Data for one, two or three counties are missing because it was not disclosed; thus study area total for that sector is underestimated. Missing data is included in the totals.

[2] Percent is underestimated because of missing information (see 1.)

[3] Figure includes local, state and federal government employees.

SOURCE: U.S. Department of Commerce, Bureau of Economic Analysis, 1980.

Irretrievable and irreversible commitments of human resources, materials and money would be made in all of the alternatives. This commitment would be governed by whether an alternative is fully or partially implemented. Some idea of the total implementation costs can be realized by the dollar amounts listed in Chapter 2, which include manpower, material and, to a degree, full expenditures.

INTRODUCTION

This chapter explains the environmental consequences of the four alternatives discussed in Chapter 2. Environmental aspects are analyzed to determine the effect of each proposal or combination of proposals of an alternative. Climate and air quality, recreation, visual resource management, and geology were not analyzed or discussed in this study, since it has been determined that these components would not be significantly affected by any of the alternatives.

The following assumptions have been made in this chapter:

1. BLM would have the funding and staff to implement, monitor and make revisions in AMPs as necessary.

2. BLM would receive sufficient funding for new developments.

3. All range improvements, grazing systems and most land treatments would be completed in 1989, five years from the beginning of the implementation in 1984.

4. Short term impacts are those which would occur during AMP implementation (1983 through 1988). Long term impacts are those following 15 years of AMP implementation (approximately by the year 2003).

5. Newly implemented grazing systems would be adhered to through at least one complete cycle. Unauthorized livestock use would be strictly controlled and would not be a significant impact causing agent.

6. BLM would verify the level of impacts and monitor the AMPs to make necessary adjustments in plans that are not meeting the desired multiple use objectives.

7. The principle resource directly affected is vegetation. Any changes in production, condition, trend, or composition of vegetation would affect other resources.

8. Each alternative is analyzed as though it would be fully implemented as described in Chapter 2.

The effects of the use of various land treatments and grazing systems on soils and watershed are shown in Appendix 4.1. Appendix 4.2 shows the methodology used in calculating watershed impacts.

ALTERNATIVE A: CONTINUED DEVELOPMENT FOR RANGE UTILIZATION

The evaluation of the 30 existing and 63 proposed AMPs and the 684 non-AMP allotments and non allocated lands would include (but not be limited to): feasibility and need for grazing treatments ie. rest and/or deferment and mechanical treatments as indicated by monitoring systems, special management considerations and protection of, for example riparian zones, crucial wildlife habitat and high erosion susceptible areas, and land treatments and range developments necessary to improve range condition while protecting watershed and wildlife resources.

Initial allocations to livestock are 253,085 AUMs, increasing to 270,115 AUMs in the long term and initial allocations to nonconsumptive uses and wildlife are 759,255 AUMs, increasing to 810,345 AUMs in the long term. Mechanical treatments based on soil capabilities (See Appendices 2.8 and 3.1) are proposed on 128,000 acres. Noxious weed and praire dog control are proposed on 4500 and 560 acres respectively. Nine hundred and sixty-nine new water developments and 230 miles of management fences are also proposed.

Watershed

Continued development and revisions of management plans is expected to decrease overall sediment yield by 20% and water yield by 18% (Table 4-1.) These decreases would be significant.

Livestock grazing on floodplains during April, May and June, would be used in conjunction with soils, watershed and plant phenology capabilities. Proper grazing management would include rest, deferment and alternating use (Hormay 1970). Absence of livestock trampling on the wet areas would result in increased cover and plant vigor. Streambanks and channels would become more resistant to erosion, water quality would be improved by reduced suspended sediment and fecal bacteria, and water temperatures would be lowered by increased shade (Holechek 1980). Sediment and water yield reductions would be greatest on soil Subgroups 1, 11, 12 and 13.

Approximately 159,000 acres were classified as being in poor or fair condition. Of those acres, 128,000 are capable of mechanical treatment. These treatments are only effective on lands with slopes less than 12% and include soil Subgroups 1, 2, 3, 4, 7, 9, 10, 11 and 13. Large areas of bare soil would be initially exposed to potential wind and water erosion. However, infiltration is improved, leading to increased soil moisture and greater vegetative cover than before treatment (Wight and Siddoway 1972; Ryerson et al. 1980; Saulmon 1973; Neff and Wight 1977; Neff 1980). Sediment yield is expected to be reduced by 200 acre feet per year (ac-ft/yr) and water yield reduced by 10,000 ac-ft/yr, both significant decreases. Long term sediment and water yields are assumed to be near zero. Runoff and erosion would not occur from mechanically treated areas unless precipitation exceeds the storage capacity of the soil (Gifford 1975; BLM 1981b).

Maintenance and new construction of range-related projects (fences, roads, cattle guards and rubs) would not be allowed

CHAPTER 4

ENVIRONMENTAL CONSEQUENCES

during wet periods where watershed damage might occur. Range facilities which promote extensive cattle concentrations (wells, fences, salt licks) would not generally be located on floodplains. Proposed range facilities are not expected to change sediment and water yields appreciably.

Surface water developments are the primary source of stock-water. Development of 494 new reservoirs would temporarily disturb soil on approximately 1500 acres. One thousand acres would be upstream of dams and would not contribute sediment downstream. The remaining 500 acres is not expected to affect sediment or water yields.

Any fencing needed for livestock or wildlife purposes is not expected to result in any measureable changes in sediment or water yields.

Ground water developments (wells) disturb very little soil. Their construction would have no effect on sediment or water yields.

Noxious weeds would be controlled. Concentrations of noxious weeds forces livestock to graze more intensely on nearby non-infested areas. This causes reduced vegetative cover and increased sediment and water yields from the heavily grazed areas (Noble et al. 1979). Treatments would result in a slight decrease in sediment and water yields. Noxious weeds appear mainly on soil Subgroups 1, 2, 3, 4, 7, 9, 11, 12 and 13.

Prairie dogs would be controlled, but not eliminated. This control would result in a very slight decrease in sediment and water yields. Prairie dogs inhabit soil Subgroups 4, 8, 9, 11, 12 and 13.

Alloted lands, not under existing or proposed AMP status, are still subject to various controls, e.g., season of use and numbers of AUM's allocated. By exercising these controls, alloted lands presently in poor and fair condition would improve to good or excellent condition. It is expected this improvement would occur by the end of the 15-year period covered by this EIS. Sediment production would be reduced by 15% and water yield reduced by 32%, both significant decreases.

The initial vegetation allocation to livestock of 253,085 AUMs, would be increased to 270,115 AUMs in the long term. This increase would result in a slight increase in consumptive use of water by livestock.

Conclusions

This alternative would reduce sediment and water yields significantly (Table 4-1). On 1,178,777 acres of public lands, sediment yield would be reduced by 20% and water yield would decrease in the long term by 18%.

TABLE 4.1
SUMMARY OF WATERSHED IMPACTS BY TREATMENTS AND FACILITIES

ALTERNATIVE A

Element	Sediment Yield (acre-feet/year) Initial	Sediment Yield (acre-feet/year) Long Term	Water Yield (acre-feet/year) Initial	Water Yield (acre-feet/year) Long Term	Water Quality	Consumptive Water Use by Livestock (ac-ft/year) Initial	Consumptive Water Use by Livestock (ac-ft/year) Long Term
Grazing Treatments	416	405	22,028	21,479	+		
Mechanical Land Treatments on 127,929 acres	209	0	10,140	0	+		
Range Facilities	0	I	0	4	0		
Water Developments	0	I	0	I	0		
Chemical Treatments							
Noxious Weeds	15	2	549	178	+		
Prairie Dogs	9	8	230	189	+		
Non-AMPs and Unalloted	514	514	27,247	27,247	0		
Total for Existing and Proposed AMPs	1,163	929	60,194	49,097	+	2,794	2,982

I — Insignificant
\+ — Increase in Water Quality
0 — No change in Water Quality
— — Decrease in Water Quality

SOURCE: BLM 1980-1981

Water quality would improve significantly in the long term with reductions in suspended sediment loading of water bodies. Water consumption by livestock would be 2,982 acre-feet/year in the long term (Table 4-1).

Increases in vegetation production would provide additional residual vegetation and litter cover necessary for watershed protection. Increased cover and litter promotes water infiltration and reduces runoff and erosion.

There would be no irretrievable or irreversible loss to soil or water resources in this alternative.

Vegetation

Current vegetation allocations would continue (livestock 25%; nonconsumptive and wildlife uses 75%). Plant vigor, production and range condition would be maintained or improved as shown by monitoring studies. Proper use allocation and improved grazing management would ensure maintenance and/or improvement of vegetation community.

Proper use insures a healthy vigorous plant community. The proper use factor for major forage plants is 50-55%. Crested wheatgrass should be used heavily (up to 80%) occasionally to maintain stand quality. Some browse species can be utilized to 60%. Use during high growth periods depletes plant reserves and reduces plant vigor. Repeated use during this period results in reduced vigor, density, and eventually range condition. Defering use past critical growth stages, rest, and use during dormancy improves plant reserves, vigor and range condition. Fast growing plants, grasses and forbs, generally respond quickly to management while slower growing woody species respond more slowly. Areas in less than good condition (155,462 acres) would improve in condition with a resultant increase in production of 54.5 million pounds of vegetation, the equivalent of 68,120 AUMs.

Improved management, range improvement placement and use supervision would result in improvement of riparian areas. Reduced use of riparian zones as forage areas and shade sources would result in an increase in cover and plant community structure and health.

Restricting the placement of salt, oilers and other developments in these zones would improve habitat condition.

Monitoring and supervision would ensure that range condition objectives were being achieved.

Grazing management would be in one of three categories: allotment management plans (AMPs), season and number, and custodial. Various grazing systems would be applied in these categories. AMPs may include rest rotation, deferred rotation, deferred, seasonal, short duration, or other systems which are variations or combinations of these. Season and number allotments would generally have deferred or seasonal systems while custodial allotments would have seasonal use coordinated with the private land where the public land is a very small part of the allotment and/or the goals of management could be met with this management level. Tame pasture seedings, treated areas, riparian zones, erosion susceptible areas and winter ranges that

require special management would use these systems also. Specific system effects are shown in Appendix 4.1.

Land treatment may be necessary to achieve objectives in some cases. Mechanical treatments would include: plowing and seeding, scalping, contour furrowing, pitting, chiselling, ripping, chaining (cabling, railing), dozing, rotobeating and mowing. Other treatments include: prescribed and natural fire and chemical treatment. The overall effect of the proper application of these treatments and associated grazing treatments would be an improvement of range condition and vegetative production. Specific impacts are shown in Appendix 4.1. Treatments would follow guidelines set forth in the MFP and Bureau policy and regulations.

Development of range improvements would reduce available forage very little, but would improve the overall condition of the allotments by providing for more even distribution and utilization.

Control of noxious weeds would be accomplished by chemical (presently most successful), biological, mechanical, or other acceptable methods of good management and policy. Results would be increases in desirable plant species, range condition, species diversity, useful vegetation production and associated watershed and economic impacts.

Control of prairie dogs would have the immediate effect of an improvement in vegetation production and range condition. Production would increase because of improved plant vigor and the transition of the plant community from low to high producing species. Increased vegetation, shade and litter would increase site moisture retention and improve plant growth conditions. Control is best obtained by poisoning. Shooting slows expansion, but is not effective in eliminating towns. Grazing management can slow expansion and has reduced town size (Snell and Hlavachick 1980). Proper forage management is critical to the success of any method or attempt.

Conclusions

Proper management (stocking, rest, deferment), mechanical treatment and control of noxious weeds and prairie dogs would result in an improvement of ecological range condition. Condition would be maintained or improved on allotments with most lands in good to excellent condition. Allotments with substantial acreage in less than good condition would be improved to good condition. An increase of 17,030 AUMs would result from the improvement. The 30 existing AMPs would be evaluated and revised, if necessary. The 63 allotments would be evaluated for AMP feasibility and 684 allotments would be evaluated for overall management needs (not necessarily system type management).

Condition of riparian areas would be improved.

The long term allocation would increase as shown above.

There would be no irretrievable or irreversible loss of vegetation resources in this alternative.

Livestock

Proper use grazing levels would provide for sustained forage production and would also lead to high livestock production. Of the 68,120 AUM increase discussed previously, 17,030 would be allocated to livestock and would feed an additional 2,838 adult cattle for a 6-month grazing season.

Most of the present seasons of use would be maintained, however, grazing seasons might be extended in the long term to use the increased forage. This would reduce the winter feeding.

Lost Boy Creek (in Allotment #2750) is used as winter range with no detrimental effect to the watershed. Grazing systems would allow for periodic deferment and/or rest of critical watershed, wildlife, and riparian areas. Treated areas (land treatment, habitat plantings, and forest rehabilitation or development) would also be provided sufficient deferment and/or rest to facilitate treatment success. There would be a temporary loss of livestock forage during rest periods.

Stress due to moving livestock would increase slightly on present and proposed AMPs. Reliable spring forage and cover for young calves would be provided in rest systems. Livestock breeding success would be improved by fencing and closer stock confinement. Changes in the grazing season and systems of nonmanagement plan allotments would be minor and have little impact on stock.

Mechanical treatments would increase the forage base, but certain restrictions would be necessary for animal health. Treated areas would not be grazed for two seasons after treatment. Livestock production would increase and distribution would improve because of treatments and improvements.

Range improvements (except reservoirs, pits, springs) would be placed off floodplains, riparian areas, or critical wildlife habitat if at all possible. Reservoir developments for wildlife habitat would be constructed or modified to assure livestock water by water gap development or pipeline and tank placement outside exclosure areas. Developments would not take place on damage susceptible areas when soils are wet, generally April - June. Fences would be built to assure movement of wildlife.

The use of vehicles would be restricted on fragile soils and treated areas.

The loss of livestock forage of varying amounts would result from the development of habitat management plans. Losses would be minimal in proposed wetland development, but would be more substantial on extensive developments (10 Mile Creek Project) or cooperative cropping of public lands for wildlife habitat development and enhancement projects. Loss of forage would continue on uncontrolled prairie dog towns.

Introduction of bighorn sheep into the Terry Badlands would not significantly impact grazing initially, as no grazing is presently allocated in the proposed introduction area. However, if water projects were developed and drew stock into the area, or the bighorns were to move into adjacent ranges after establishment, adjustments would be necessary.

Exploration for minerals generally causes the loss of an insignificant amount of forage. Mineral development could cause substantial losses in major development areas.

Conclusion

Livestock production would increase and distribution would improve because of mechanical treatments and range improvements. Grazing seasons might be extended in the long term due to increased forage. Moving livestock on present and proposed AMPs would increase stress slightly. There would be no irretrievable or irreversible loss of livestock resources in this alternative.

Wildlife

With continued development directed at optimum range utilization, local increases in wildlife could be expected. Such increases cannot be quantified because they would be conditional upon each allotment's characteristics and upon the activities on neighboring private lands.

Livestock and wildlife management can be very compatible. Compatibility would be maintained by identifying and resolving conflicts at the allotment level. Specific actions cannot be discussed in a general document such as an EIS because of differences in: 1) soils, topography and vegetation of individual allotments; 2) operation of those allotments; and, 3) distribution, density, seasonal use and species composition of wildlife occurring on the allotments. Consequently, discussions of impacts here will be general with specifics referred to the allotment planning and management level.

Although 85% of the public lands in the EIS area have been classified in good to excellent range condition, specific habitat conditions have not been classified. Consequently, monitoring of allotment management systems would be designed to evaluate condition, trend and utilization of wildlife habitats. From the results of monitoring, adjustments in allocations of vegetation or grazing systems; or additions of rangeland developments (e.g. fencing, water source development) would be incorporated to maintain or improve crucial habitats or specific habitat needs.

Riparian and woody draw habitats are vulnerable to livestock use (Gjersing 1980). Any type of livestock grazing on riparian and woody draw habitats diminishes woody vegetation. Of the commonly used grazing systems, rest-rotation is the most suitable to maintaining the vegetative diversity of riparian and woody draw habitats. Options for improving those habitats include modifying grazing systems, dispersal of water sources and fencing. A rest-rotation grazing system should be given priority consideration on all areas supporting riparian and woody draw habitats.

Developments in crucial habitats would be carefully evaluated and, if necessary, relocated to protect wildlife values (e.g. minimize placing livestock water and salt sources in riparian and woody draw habitats).

Big Game

With regard to upland vegetative habitats, big game and livestock uses of public lands have been compatible. To the contrary, extensive conversion of rangelands to grain fields has not supported previous big game numbers. Surveys by the Montana Department FW&P (Region 7) show an inverse correlation between antelope numbers and large-block conversion of range-

land to grain cultivation. This has locally heightened the value of public lands to wildlife. Where livestock and wildlife uses conflict, specific treatments that may be needed (e.g. special vegetation allocations, modifications of grazing treatments, vegetation manipulations) will be identified and applied on a case-by-case basis.

As each AMP is reviewed or implemented, crucial habitats by season of use would be identified and evaluated for needs at the allotment level. Allotment monitoring would be established to track condition, trend and utilization of crucial habitats and to prescribe management treatments. Crucial wintering areas are shown on Map 2 (Map Supplement). Additional crucial habitats will be delineated and monitored as they are identified (i.e., fawning areas, crucial summer range, riparian areas and hardwood draws, etc.)

Because of their importance to big game animals, riparian and woody draw habitats would be treated as previously discussed to improve their condition and allow for regeneration of key woody species.

Proposals for treatments to sagebrush-grasslands would be evaluated to determine effects upon wildlife species that are dependent upon sagebrush. Treatments on antelope winter ranges would be designed to meet the forage needs of antelope

Rest or deferred grazing of areas in less than good condition would improve vegetative production and the quality and quantity of big game forage. Grazing systems on crucial big game ranges would be selected to maintain key vegetative species. On the non-AMP allotments, big game forage production would likely remain the same and the present competition for forage, if any, would likely remain.

Monitoring would be necessary to: 1) evaluate the success in meeting vegetation allocation objectives; 2) identify crucial habitats; and, 3) identify special treatment needs.

Techniques to obtain those data could be simple transect layouts to fence exclosures. Construction costs of facilities would range from a few dollars each for simple transects to approximately $1,000 each for two-acre exclosures. Data collection and analysis and facilities maintenance would cost an estimated $4,000/year, which is primarily manpower funding.

Transplanting wildlife may be desirable to invigorate a population or to utilize currently under used or unused habitats (e.g. introduction of bighorn sheep into the Terry Badlands). (See previous livestock section.) Any proposed manipulations of wild animals must be done in cooperation with the Montana Department of Fish, Wildlife and Parks.

Fencing for livestock and other management purposes would be constructed to allow big game movements as stated in B.5 of the Methods and Range Developments (Appendix 2.2). If woven wire is used, antelope passes or other devices for allowing passage would be provided as needed.

Upland Game Birds (Sharp-Tailed Grouse, Sage Grouse, Ring-Necked Pheasant)

In the long term additional residual vegetation from rest or deferred grazing treatments on all of the AMP allotments would help provide cover and food for increases in upland game birds. Livestock grazing on areas identified as crucial to grouse nesting and brood rearing would be managed to provide a residual grass cover of 4 to 6 inches if the production potential of the site allows. If the current allocation of 75% to nonconsumptive and wildlife uses does not meet those needs, additional allocation to wildlife would be necessary.

Livestock grazing on sage grouse wintering - nesting complexes would be managed to maintain stands of sagebrush with 15 to 30% crown coverage to meet the annual habitat requirements of sage grouse. Manipulations of sagebrush habitats must be closely evaluated in communication with state wildlife personnel because of the potential effect on wildlife.

Riparian and woody draw habitats would be treated as discussed in the previous section to maintain their values for upland game birds and other wildlife.

Turkeys

Management for wild turkeys would be provided through maintenance and improvement of habitats as the need and/or opportunities are identified. Treatments to accomplish this would include prescribed burning, plantings and mechanical methods of vegetation manipulation.

Waterfowl

The response of vegetation to rest at reservoirs, streamside riparian areas and saline seeps would increase the quality and quantity of food and cover used by waterfowl in these areas.

Additional wetlands would be constructed largely in the form of reservoirs for livestock. Blasted potholes and other forms of wetlands may be more desireable where conditions are suitable. The upper ends of existing reservoirs would be considered for fencing to provide cover for waterfowl use as funding and manpower capabilities allow. Wetlands developed for waterfowl use would be managed (using grazing modifications, fencing, etc) to provide nesting and brood-rearing cover and livestock access to water. Wetlands with a moderate to high waterfowl production potential would be managed to provide 8 to 10 inches of residual cover.

Nongame

Grazing systems would be selected to provide sufficient cover for nongame wildlife. Riparian and woody draw habitats and wetlands would receive either rest or deferred grazing as needed to provide food and cover to a diversity of nongame wildlife species.

Shore bird populations would increase with the improvement of shorelines around reservoirs and natural potholes. New water sources would provide additional shoreline for shore birds.

Allotment boundary, pasture and livestock exclosure fences would provide additional perching sites for many nongame birds such as hawks, eagles, larks and lark buntings.

The known prairie dog towns presently occupy approximately 2900 acres in the EIS area. Permittee requests for prairie dog control on public lands would be evaluated on a case-by-case basis as described in the statewide prairie dog management policy (Appendix 2.6). Under this alternative, if significant range resource damage is being caused, towns may be eliminated or controlled in size. Towns proposed for treatment would have to be surveyed for black-footed ferrets and certified free of ferrets before treatment could be authorized. Nontoxic control methods would be encouraged where feasible to obtain the proposed objectives. Toxic control would be used where other methods will not produce the desired results.

Fisheries

Reservoirs identified as suitable for recreational fishing would be fenced to provide and maintain a quality fisheries environment. Tanks, water gaps or other means of livestock access to water would be provided.

Conclusions

The effect of Alternative A on wildlife populations would be dependent upon the levels and types of grazing practices proposed. Livestock use would moderately limit the capability of public lands to provide additional wildlife habitat demand. Such demand would be shifted from private rangelands converted to intensive farming use.

Overall, wildlife habitats would remain at current condition levels. Crucial habitats would be moderately improved. Monitoring would be relied upon heavily to determine that wildlife habitats are not deteriorated and that the objective of crucial habitats are being met.

In the long term, wildlife numbers would remain about the same with short term fluctuations above and below the long term averages. Short term adverse effects on wildlife populations are irretrievable but the situation may be reversible with the capabilities to change management practices.

Cultural Resources

Cultural evidence is meaningful largely in relation to the degree that the site from which it comes has remained undisturbed. An artifact or feature might be important, but the association or context in which it was found might be much more significant. When these sites are disturbed, the opportunity for serious analysis by the archaeologist or historian is lost, as is important information about the past.

Alternative A calls for the implementation of grazing and land treatments, including the development of grazing systems, construction of range facilities and water developments and use of mechanical treatments such as plowing, seeding or scalping. Because significant adverse effects occur to a cultural site when it is altered by ground disturbance, mechanical treatments and water developments could cause adverse impacts to these resources.

On the other hand, forage allocation, grazing treatments, chemical treatments and range facilities each improve ground cover, but do not cause significant surface disturbance. Thus, they should actually improve preservation of cultural resources by

improving the conditions which maintain the integrity of a site. No data exists which allows quantification of such a benefit, however, on the basis of existing cultural resource inventory data for the study area, a density of 1.5 to 5 cultural sites per 640 acres can be determined. (This is an estimate of low statistical reliability given in Chapter 3.) Therefore, under Alternative A, roughly between 200 and 1,000 sites could be adversely affected.

Because a Programmatic Memorandum of Agreement (PMOA) is in effect between BLM and the Advisory Council on Historic Preservation (Appendix 4.3), specific procedures would be followed to identify actual effects of range projects on cultural sites and to avoid or to mitigate those impacts. Therefore, adverse impacts from range developments will generally be avoided through project design. In a few instances, recovery of cultural resource data by scientific excavation may be necessary to mitigate destruction of cultural information

Conclusion

Inventory and assessment of cultural resources directly affected by range developments would provide immediate gains in scientific knowledge of the area and a data base for long term gains. Long term loss of scientific data could occur if an inventory did not discover a site that was subsequently destroyed during construction. However, the loss is not expected to be great. Any cultural site inadvertently destroyed would be irretrievably and irreversibly lost.

Social and Economic Impacts

Ranch Economic Impacts

The short term impact on overall ranch income in this alternative would be minimal. The only change would be the temporary disruption of grazing as mechanical treatments are applied or grazing systems implemented.

In the long term 350 operations would show increases in ranch income while 258 would have no change. These increases are shown by representative size category in Appendix 4.4. The average affected operator would receive approximately a 13 percent increase in public forage and about a 3 percent increase in total ranch AUMs. The average increases in net annual income for the representative operations range from $157 for large livestock and large cash crop operations to $1,408 for large livestock-medium cash crop. The average percentage increases in net annual income range from 6.7% to 0.2%. The smaller representative operations have the larger percentage increases in net income. Total increases in gross annual livestock sales and net annual income to all affected ranch operations would be approximately zero and $205,638, respectively, an increase of 2 percent of the current livestock income for all ranches in the study. Greater income because of increases in public forage would improve the economic well-being of operators in a number of ways. Those who might have diverted funds for allowance for depreciation, deferred maintenance or deferred principal and interest payments would be in a position to use more funds for these purposes. Increased income might also be used to raise the living standards of some operators.

Total permit values in this alternative would increase by $1,703,000 or 6.9 percent of the present total in the long term. These increases would have a beneficial effect on ranchers' borrowing capacity and the sale value of affected ranches. There would be no short term change. The short and long term increases in ranch employment would be zero because there would be no changes in herd size.

Recreation/Wildlife Related Economic Impacts

There are no quantifiable impacts on game populations under this alternative. As such, there are no quantifiable changes in hunter use, expenditures, or economic impacts.

Social Impacts

Although difficult to quantify, social impacts to the ranching community from this alternative would be positive overall in both the short and long terms, as ranchers would be in a position to benefit from improved vegetative productivity and increased livestock numbers allowed on the public rangeland. The opportunities available to ranchers to increase their income might, in turn, allow them to improve their standard of living and to strengthen their overall sense of well being.

This alternative also proposes to allow treatment of prairie dogs and noxious weeds. Because this alternative would raise the level of range improvements constructed, it would agree with the perception of the majority of ranchers interviewed that the range must be improved, where needed, if it is to be properly managed. Overall, ranchers who were interviewed felt the condition of public rangelands in the Big Dry area is satisfactory, but said they would welcome the opportunity to be able to adjust management patterns as conditions warrant.

If this alternative were implemented, it would also be expected that the current good working relationship that exists between BLM and the ranching community would be reinforced, as the proposed action was the preference of the vast majority of ranchers interviewed or who submitted written comments.

The social well-being of approximately 350 ranch families would be positively affected in the long term. There are no significant impacts in the short term.

Wildlife advocates and recreationists would experience beneficial impacts from increases in wildlife numbers, resulting in both the short and long terms under the proposed action. Conservation groups concerned about the protection and enhancement of wildlife and wildlife habitat generally favor multiple use of public lands. Thus they would also approve of the balanced multiple use aspect of the proposed action. Some people may feel, however, that the alternative does not depend heavily enough upon use of fences to protect riparian areas, which are a major concern of many wildlife groups across the country. Wildlife enthusiasts may, in addition, anticipate beneficial impacts from additional AMP implementation planned under the proposed action, although the number of AMPs planned may be considered insufficient in the long term.

Conclusions

Impacts resulting to the ranching community from this alternative would be positive overall in both the short and the long terms. Ranchers would be in a position to experience income gain due to the improved productivity of the public range. This, in turn, would lead to increased levels of well being and sense of security regarding the future. Current positive attitudes toward the BLM would be reinforced, as this was the preferred alternative of almost all ranchers interviewed or submitting comments, most of whom say they are satisfied with the present condition of public rangelands in the area.

Impacts to members of wildlife groups and to recreationalists would be beneficial overall, due to the increases in wildlife numbers expected in both the long and short term.

Regional Economic Impacts

Appendix 4.5 shows the impact on output, earnings and employment of increased livestock sales, range development construction, recreationist expenditures and government employment. Impacts are shown in both the short and long term. In the short term the largest effect on earnings would be from increased construction. There would be no effect in the long term on earnings.

Total employment would increase by 134 people in the short term and no additional hiring in the long term. Total earnings would increase by $1,635,000 annually in the short term and none additional in the long term.

Conclusions

In the short term, there would be no change in incomes, permit values or employment for ranch operations.

In the long term, income for 350 ranch operations would increase by $205,638 annually (an increase of 2.3 percent over the current livestock income for all ranches in the study). Permit values would increase by 6.9 percent and ranch employment would not change. These increases would be moderately significant.

The short term direct and indirect increases of less than 1.0 percent in study area earnings and employment would be insignificant overall. There would be no change in the long term.

There would be no irretrievable or irreversible loss under this alternative.

ALTERNATIVE B: ENHANCED WATERSHED VALUE AND WILDLIFE HABITAT

The area's 30 AMPs (covering 227,776 acres) would be revised to meet this alternative's objectives of enhancing watershed values and wildlife habitat. An additional 63 AMPs (covering 294,798 acres) would be developed, incorporating grazing and land treatments to meet the same objectives. An additional 684 allotments (651,781 acres) would not be considered for AMPs at this time. A total of 4,442 acres remain as unallocated land in scattered, small tracts through the resource area. The number of AMP and nonsystem allotments would be the same as for alternative A, but grazing treatments and individual AMP objectives would reflect the change in management emphasis.

The initial allocation to livestock would be 19 percent less than the current permitted use of 253,085 AUMs. The reduction in livestock AUMs would result from grazing deferment until July 1: (1) on those areas susceptible to damage by use during wet seasons, (2) on riparian and wooded areas, and (3) to reserve winter wildlife forage and vegetation on prairie dog towns and the elimination of grazing on 193 allotments (179,988 acres) where crucial wildlife habitat occurs.

Water development and noxious weed control would be the same as outlined for Alternative A. Other range developments and actions would be: (1) pasture or allotment boundary fences; and, (2) prairie dog control would be applied only to protect private land and crucial wildlife habitat.

Watershed

Enhancement of watershed and wildlife habitats is expected to reduce overall sediment yields by 28% and overall water yields by 23% (Table 4-2). The decreases would be significant.

This alternative would have essentially the same long term effect on watershed as Alternative A except for floodplain areas. In Alternative B there would be no livestock grazing on floodplains during April, May and June each year and on the 193 allotments (179,988 acres) where crucial wildlife habitat exists. In Alternative A, livestock would be deferred from grazing on floodplains when and where possible.

There would be about 50,000 less AUMs allocated to livestock in Alternative B than in Alternative A. Some of these lost AUMs are the result of the three month deferment. This loss in AUMs would mean less cattle trampling, soil compaction, streambank sloughing and greater vegetative cover. Sediment and water yields would subsequently be slightly reduced.

Mechanical treatments, development of range facilities and water sources, treatment of noxious weeds, and fencing would have the same effect on sediment and water yields as in Alternative A.

Prairie dogs would be allowed to increase short of affecting private lands or crucial wildlife habitats. This would result in a very slight increase in sediment and water yields.

TABLE 4.2
SUMMARY OF WATERSHED IMPACTS BY TREATMENTS AND FACILITIES

ALTERNATIVE B

Element	Sediment Yield (acre-feet/year) Initial	Sediment Yield (acre-feet/year) Long Term	Water Yield (acre-feet/year) Initial	Water Yield (acre-feet/year) Long Term	Water Quality	Consumptive Water Use by Livestock (ac-ft/year) Initial	Consumptive Water Use by Livestock (ac-ft/year) Long Term
Grazing Treatments	416	405	22,028	21,646	+		
Mechanical Land Treatments on 127,929 acres	209	0	10,140	0	+		
Range Facilities	0	I	0	4	0		
Water Developments	0	I	0	I	0		
Chemical Treatments							
Noxious Weeds	15	2	549	178	+		
Prairie Dogs	9	10	230	245	0		
Non-AMPs and Unalloted	514	414	27,247	24,473	0		
Total for Existing and Proposed AMPs	1,163	831	60,194	46,576	+	2,257	2,434

I — Insignificant
\+ — Increase in Water Quality
0 — No change in Water Quality
— — Decrease in Water Quality

SOURCE: BLM 1980-1981

Consumptive use by livestock would increase slightly in the long term, but would be lower than Alternative A because of the loss in AUMs.

Conclusions

This alternative would result in a 28% decrease in sediment yield and a 23% decrease in water yield in the long term (Table 4-2).

Water quality would improve significantly with reductions in suspended sediment in surface waters. Water consumption by livestock would be 2,434 acre-feet/year in the long term.

Improvements in watershed condition would be due mainly to the deferment of grazing for 2 months in the spring. Spring deferment would allow plants time for phenological development that improves plant production and consequently watershed cover.

There would be no irretrievable or irreversible loss to soil and water resources in this alternative.

Vegetation

Vegetation would be allocated to livestock at a lower level in the short term. There would be a slight increase in the long term, but the present allocation levels would not be reached. Grazing of severe erosion potential areas and floodplains would be eliminated during April, May, and June. No livestock grazing would be allowed on critical wildlife winter range or riparian areas. Livestock allocations would be reduced by 19% (48,674 AUMs).

Because of grazing deferment, rest treatments, or lighter range use, about 158,000 acres would improve in ecological condition. Vegetation production would increase by 68,120 AUMs (in terms of livestock AUMs). A total of 17,030 AUMs (25%) of the increase would be allocated to livestock (Appendix 2.4). The remaining 51,090 AUMs (75%) would be allocated to nonconsumptive and wildlife uses.

Vegetation on areas deferred from spring grazing would improve in vigor, density, and production because of rest from grazing during critical growth stages. Cool season grasses and forbs would generally respond quickly to this treatment. Warm season grasses, shrubs, and trees would not respond as quickly.

Vegetation on rested or grazing-excluded areas (crucial wildlife winter ranges, habitat development areas, riparian zones) would respond similarly. All species would benefit, but slower growing trees and shrubs would benefit most. Shrub and tree regrowth would occur more quickly than on deferred areas. Overall plant production would increase to near potential and then decrease as

the vegetation community stagnated.

Vegetation on those areas grazed under other grazing systems would improve, but at a slower rate. Plant production, vigor, and density would increase to that expected on good quality rangeland.

If rangelands fail to respond to grazing treatments and mechanical treatment becomes necessary, about 128,000 acres could be treated (Appendices 2.8 and 3.1). If sufficient desirable native seed is available prior to mechanical treatments or is interseeded, vegetation production would increase an equivalent of 55,140 livestock AUMs. Only 25 percent of this total (13,785 AUMs) would be allocated to livestock. The remaining vegetation would be allocated to watershed cover and wildlife habitat.

Livestock trailing along fences would reduce vegetation production slightly. Water developments, management fences and the proper placement of salt and minerals would reduce the use of floodplains and other concentration areas by improving livestock distribution.

Leafy spurge and other noxious weeds would be controlled, as discussed previously and result in an improvement of 4,500 acres of public land. Prevention of infestation of other lands would result.

Vegetation production on prairie dog towns would continue at its present low level. Additional lands would be colonized by prairie dogs and ecological condition, plant vigor, and production would decline.

Habitat and forest plantings would become established and their vegetative production would increase. That increase would likely coincide with a similar decrease in the natural plant community.

Monitoring would be done to insure the accomplishment of management objectives as discussed previously.

Conclusions

Deferment of spring use, light grazing, rest and deferment treatments, mechanical treatments and noxious weed control would improve the ecological condition of 95,491 acres. Plant vigor, litter cover and water infiltration would improve on all allotments.

Treatments would improve vegetation conditions in riparian areas, around reservoirs, floodplains and erosion susceptible areas.

The long term livestock allocation would be 32,646 AUMs or 13 percent below the present 253,085 AUMs, a significant decrease; nonconsumptive and wildlife AUMs would increase from 759,255 to 860,021 or 12 percent.

Ecological range condition would improve significantly.

There would be no irretrievable or irreversible loss of vegetation resources in this alternative.

Livestock

This alternative would reduce current livestock AUMs by 19+ percent. The loss of grazing during April to June on erosion susceptible areas and floodplains and of all grazing on crucial wildlife winter ranges and riparian areas would have a very high negative impact on livestock. A total of 48,674 AUMs of forage would be lost from these areas (Appendix 2.4), but a far larger amount of forage would be lost from other public and private lands in the same pasture. Grazing would be totally eliminated in the spring or yearlong on some allotments, if this alternative is adopted.

Fencing of these areas would allow grazing on noncrucial lands, but due to the nature (scattered, small, often linear, mixed ownership) of these tracts, fencing would not be a viable alternative. A huge investment of labor, materials and construction of additional water sources would be required for construction and maintenance of fences as required. Management would be made very difficult by the reduction in pasture size, stock traps created by exclosure fences, odd shaped pastures, and additional water needs. The mixed public-private land ownership pattern rules out fencing or grazing exclusion on these lands. However, for analysis purposes, an additional 1532 miles of fence would be considered to exclude or restrict grazing from/on riparian zones, floodplains, wildlife reservoirs, winter ranges, or prairie dog towns as specified in MFP 1.

The 204,411 AUMs allocated in the short term and the 220,439 AUMs allocated in the long term would allow grazing at light use levels. About 20 percent of the vegetation would be used by livestock. This level of use would be beneficial to livestock production as the stock could be more selective grazers. Any change from the current livestock production levels would be dependent on the present degree of use in a particular allotment. Changes would vary from none to significant improvements in per-animal production.

Livestock production would also be affected by loss of use of some plants that are only available or palatable in the spring. Bluegrass, prairie junegrass and many forbs complete their life cycles during the period when grazing would not be allowed and these plants become dry and unpalatable during the time grazing would be allowed. Needle and thread, another important livestock forage plant, develops sharp awns in the summer, reducing its palatability. Although forage supplies would be abundant at the beginning of the grazing season, livestock would not fully benefit, since the greatest livestock gains take place when forage is green and growing (Hormay 1970; Smoliak 1960).

Mechanical treatments would increase forage supplies as discussed previously. Forage increases due to grazing and mechanical treatments would not offset the grazing reduction discussed above.

Other forage losses would likely result from several recommendations made in this alternative. Habitat management areas (Ten Mile Creek, westland habitat and fisheries development) would be devoted to wildlife purposes and the exclusion or reduction of livestock grazing would be a distinct possibility. Fencing of selected reservoirs and riparian areas without provision for livestock water would improve the vegetation resource in the fenced areas, but would eliminate grazing on the range dependent on that water source. Uncontrolled prairie dogs would increase substantially and decrease livestock allocated forage.

The introduction of bighorn sheep into the Terry Badlands would have the immediate effect of delaying livestock allocation increases to adjacent allotments. The ultimate effect of the introduction would vary from none to a reduction of livestock allocations or prohibition of domestic sheep use on adjacent ranges.

Conclusions

This alternative would result in an increase for watershed and wildlife of 48,674 AUMs in the short term and 100,766 AUMs in the long term. Livestock numbers would decline as a result in a loss of 48,674 AUMs in the short term and a loss of 32,646 AUMs in the long term.

There would be an irretrievable reduction in permitted AUMs in this alternative but this would not be irreversible.

Wildlife

Vegetation allocations, livestock grazing systems, vegetation manipulations, mechanical treatments and range improvements on crucial wildlife habitats would be restricted to those that enhance the wildlife values of those habitats. Special management needs of crucial habitats would be identified through the monitoring system. Management methods to meet those needs would be implemented in AMPs.

Acquisition by exchange, purchase or lease agreement of crucial habitats or portions of crucial habitats would be considered to improve management opportunities.

Big Game (Deer, Antelope and Bighorn Sheep)

A general vegetation allocation of 75% for nonconsumptive and wildlife uses and 25% for livestock would adequately meet the general cover and forage requirements of big game species in the area. However, special management for crucial habitats (e.g. winter range, fawning areas, crucial summer range) would be identified through monitoring and implemented. Significant, permanent increases in deer and antelope numbers are not expected to occur as discussed under Alternative C.

In accordance with Step 1 of the Management Framework Plans for the EIS area, all of the vegetation on winter ranges would be allocated to wildlife (all species) and watershed. This involves approximately 180,000 acres of public land in 193 allotments. The vegetation reservation would be approximately 30,242,400 pounds. At 800 pounds monthly forage requirement for cows, winter range reservations for wildlife equate to a loss of nearly 38,000 AUMs. To effect this reservation, grazing deferments would be utilized to minimize competition for big game winter forage. Fencing may be necessary, but only as a last resort.

Areas identified for vegetation manipulation could provide a diverse plant community if the treatment methods were prudently selected and applied. Such treatments would benefit big game and other wildlife in terms of food and cover.

Resting riparian and woody draw habitats by the most compatible and economic methods (modified grazing, fencing, etc.) would provide additional forage and cover for big game. Rest rotation grazing would be given priority consideration, since it is the most compatible system for sustaining riparian and woody draw habitats.

Reintroduction of bighorn sheep into the Terry Badlands would be evaluated and implemented, if feasible. There is no present allocation of forage to livestock in a portion of the Terry Badlands and that reservation for wildlife would be maintained as long as introduction efforts produce viable results. Such a program would be conducted in cooperation with the Montana Fish, Wildlife and Parks Department. To accommodate expansion in population and distribution, there would be no increment in livestock forage allocations on adjacent allotments.

Fences would be the least restrictive to big game movements as stated in B.5 of the Methods and Range Developments (Appendix 2.2).

Upland Game Birds (Sharp-Tailed Grouse, Sage Grouse, Ring-Necked Pheasant)

Livestock grazing would be managed to leave 4 to 6 inches of grass for nesting and escape cover for ground nesting birds on range sites capable of such production. Spring-early summer deferment of residual vegetation would provide adequate cover for nesting and brood rearing for upland game birds on AMP allotments. Grazing treatments that allow additional rest or deferment would be used to provide residual winter food and cover. Upland game bird production would increase slightly.

A variety of food and cover could be made available to upland game birds (especially sharp-tailed and sage grouse) with well planned vegetation treatments (burning, mechanical, chemical, etc.)

Riparian and woody draw habitats would be treated as needed to improve their condition. Possible treatments include changes in grazing systems and/or seasons, improved water distribution, vegetation manipulation, and fencing. These treatments would be considered on a case-by-case basis. Vegetation plantings would also be considered to stabilize drainages.

Sagebrush habitats would be maintained to provide stands with canopy coverage of 15 to 30%. These densities provide the stand diversity needed to meet sage grouse requirements for nesting, brood rearing and winter use. Sage grouse population should show a slight increase.

Turkeys

Vegetation management on important wild turkey habitats (e.g. areas used for nesting, wintering, roosting) would include compatible grazing systems, vegetation plantings and prescribed burning. Suitable treatments would be implemented to meet the needs of turkeys using those habitats.

Waterfowl

The vegetation response from resting high value riparian vegetation and saline seeps would increase the quality and/or quantity of food and cover and contribute to increased waterfowl production.

New and existing fisheries reservoirs would be fenced with a 100-foot buffer strip along the shoreline for wildlife needs. Depending upon the size of the reservoir (using the smallest and largest known in the EIS area as outer limits), 200 to 2400 pounds of vegetation would be removed from livestock use at each reservoir site. (See Appendix 2.1, Recommendation WL-3.4 for computation rationale.) At 800 pounds of forage equivalent to one AUM, forage removal could cost from 0.25 to 3 AUMs of livestock use at each reservoir. Increase in waterfowl use and production cannot be quantified.

Existing reservoirs with a good potential for use could be improved for waterfowl production with construction of nesting islands and installation of artificial nesting structures.

Fencing may become necessary to enhance waterfowl values of existing reservoirs with a high potential for waterfowl production.

On suitable soil types, wetlands other than reservoirs (blasted potholes, water spreading dikes, canals) might be constructed to benefit waterfowl. No specific locations or projects have been identified.

Nongame

Range management and livestock exclosure fences would provide additional perching sites for many nongame birds. Complete resting of riparian habitat, periodic resting of woody draw habitat and fencing of reservoir seeps would provide food and cover to a wide variety of nongame.

Applications of pesticides on public lands would be carefully evaluated to prevent indiscriminant treatments. Label cautions and directions would be followed. Buffer zones would be provided between treatment areas and water areas. Use of chlorinated hydrocarbons (DDT, Endrin, Dieldrin) to control insects would be prohibited on public lands.

Shore birds would increase with the improvement of existing and additional reservoir shorelines.

Approximately 2900 acres of prairie dog towns are currently known to occur in the EIS area. Vegetation on prairie dog towns would be allocated to wildlife. Restricting water developments to further than 1/4 mile from prairie dog towns would support such allocation. If towns were untreated (i.e., except when threatening to private lands and/or crucial wildlife habitats or becoming a reservoir for incubation and dispersion of disease), prairie dogs would consume additional acreage and reduce additional livestock forage (assume 5% increase in affected area per year). Potential habitat for the black-footed ferret, burrowing owl, mountain plover and other species associated with prairie dog towns would be maintained.

Fisheries

Seventeen existing and 33 proposed reservoirs are identified as suitable or potentially suitable for fisheries. (See New Prairie and Jordan-North Rosebud MFPs.) These would be fenced to reserve all of the vegetation within 100 feet of the high water level. Nearly 40,000 pounds of vegetation would be removed from livestock use, which equates to almost 50 AUMs. Additional reservoirs developed for fisheries use would be treated similarly.

Conclusions

The effect of Alternative B on wildlife populations is less dependent upon levels and types of grazing practices proposed than Alternative A. Livestock use would not seriously limit the capability of public lands to accommodate additional wildlife habitat demand shifted from private rangelands converted to intensive farming use. Overall, wildlife habitats would remain at current condition levels. Crucial habitats would experience accelerated improvement in the short term. Certain resultant successional changes (i.e., reversion of shrub ranges back to grasses) may not provide optimum big game forage production.

Unique to this alternative would be the proposal to allocate 100% of the vegetation on winter ranges to wildlife. Included in this category, is the proposal to fence existing and future fishery reservoirs to promote cover for nesting waterfowl.

Monitoring would be relied upon heavily to insure that wildlife habitat objectives are met.

In the short term, wildlife numbers would increase. In the long term, overall wildlife numbers would average higher than in Alternative A. Cycle flutuations above and below the long term average would still occur.

There would be no short term or long term irretrievable or irreversible adverse effects to wildlife populations.

Cultural Resources

Cultural evidence is meaningful largely in relation to the degree that the site from which it comes has remained undisturbed. An artifact or feature might be important, but the association or context in which it was found might be much more significant. When these sites are disturbed, the opportunity for serious analysis by the archaeologist or historian is lost, as is important information about the past.

Alternative B calls for the implementation of grazing and land treatments, including the development of grazing systems, construction of range facilities and water developments and use of mechanical treatments such as plowing, seeding and scalping. Because significant adverse effects occur to a cultural site when it is altered by ground disturbance, mechanical treatments and water developments could cause adverse impacts to this resource.

On the other hand, forage allocation, grazing treatments, chemical treatments and range facilities each improve ground cover, but do not cause significant surface disturbance. Thus, they should actually improve preservation of cultural resources by improving the conditions which maintain the integrity of a site. No data exists which allows quantification of such a benefit, however. On the basis of existing cultural resource inventory data for the study area, a density of 1.5 to 5 cultural sites per 640 acres can be determined. (This is an estimate of low statistical reliability given

in Chapter 3.) Therefore, under Alternative B, between 200 and 1,000 sites could be adversely affected.

Because a Programmatic Memorandum of Agreement (PMOA) is in effect between BLM and the Advisory Council on Historic Preservation (Appendix 4.3), specific procedures would be followed to identify actual effects of range projects on cultural sites and to avoid or to mitigate those impacts. Therefore, adverse impacts from range developments will generally be avoided through project design. In a few instances, recovery of cultural resource data by scientific excavation may be necessary to mitigate destruction of cultural information

Conclusion

Inventory and assessment of cultural resources directly affected by range developments would provide immediate gains in scientific knowledge of the area and a data base for long term gains. Long term loss of scientific data could occur if an inventory did not discover a site that was subsequently destroyed during construction. However, the loss is not expected to be great. Any cultural site inadvertently destroyed would be irretrievably and irreversibly lost.

Social and Economic Impacts

Ranch Economic Impacts

There would be short-term decreases and long-term increases and decreases in net ranch incomes in this alternative.

Appendix 4.6 displays negative short-term impacts to operations with AMP allotments by representative size category. In addition, there would be an additional temporary loss in grazing as mechanical treatments are applied or grazing systems implemented. These losses could represent a significant impact to a few individual operators when their land is out of production. A total of 418 operations show a decrease and 190 would have no change. Of those operators that would receive decreases, the average decrease is 27 percent in public AUMs or about six percent in total ranch AUMs. The average decrease in net annual income for the representative livestock categories ranged from $588 in small livestock/large cash crop operations to $3,434 on very large livestock/small cash crop operations. The average percentage decreases in net annual income range from 1.2 to 11.9 percent. The representative operations with more cash crops generally have smaller percentage decreases in net income. Total short-term decreases in annual income to all affected ranch operations would be $589,306. This is 6 percent of the current livestock income for all ranches in the study.

Appendices 4.7 and 4.8 display impacts in the long term to operations by representative size category. One hundred and seventy-six operations show an increase, 335 show a decrease, and 97 show no change in the long term. For those operations that would receive an increase, the average increase is 13 percent in public AUMs and about 3 percent total ranch AUMs. Those operations would sustain an average increase in net annual income of $517. The average increase in net annual income for the representative livestock categories ranges from $165 on very large livestock/small cash crop operations to $885 on medium livestock/medium cash crop operations. The average percentage increases in net annual income range from 0.3 to 6.5 percent. The smaller representative operations generally have larger percentage increases in income.

For those 335 operations that would receive decreases, the average decrease is 20 percent in public AUMs and 5 percent in total ranch AUMs. These operations would sustain an average decrease in net annual income of $1,437. The average decrease in net annual income ranges from $535 on very large livestock/large cash crop to $3,158 on very large livestock/small cash crop operations. The average percentage decreases in net annual income range from 0.5 to 12.0 percent. The smaller representative operations have larger percentage decreases in net income.

Total increases in annual income to all affected ranch operations would be $90,938 and total decreases $481,485. This is a net decrease of $390,547, four percent of the current livestock income for all ranches in the study.

Total permit values would decrease by $4,866,000 in the short term and $3,264,000 in the long term. The long-term figure is a 13 percent decrease over the present total. Those ranchers who have an increase in permit value would benefit from an increase in borrowing capacity and in ranch sale value. Those with decreases in permit value would have the decreases in borrowing capacity and ranch sale value.

The decrease in ranch employment would be the full time equivalent of about 28 (8%) employees in the short term and 23 (6%) in the long term.

Recreation/Wildlife Related Economic Impacts

There are no quantifiable impacts on game populations under this alternative. As such, there are no quantifiable changes in hunter use, expenditures, nor economic impacts.

Social Impacts

Social impacts to the ranching community which might result from this alternative would be negative, as some ranchers would be scheduled for loss of AUMs to watershed and wildlife enhancement. While some ranchers would be faced with having to alter their present management patterns to accommodate a change in season of use, other ranchers who are highly dependent on public lands and who could not afford to keep cattle on base properties or to purchase hay to compensate for the loss of public forage, may suffer some economic impacts. If their economic stability were sufficiently threatened, it could force their families into lower levels of consumption and increase their anxiety about the future. These social impacts are, by their nature, difficult to quantify.

Many ranchers might also perceive a change in season of use as unnecessary government interference in grazing patterns which they feel have worked well for generations to the benefit of both cattle and wildlife. The majority of ranchers interviewed consider livestock grazing to be the best and most productive use of the public lands, one which they feel is conducive to multiple use. The majority of ranchers interviewed also felt removal of cattle from public lands for the protection of wildlife was unnecessary. Their experience shows that wildlife generally prefer to feed on private lands and they believe this is unlikely to change in the immediate future regardless of any policy changes by the BLM. Consequently, this alternative could have a predominately negative effect on the ranching community's perceptions of the BLM, possibly threatening the good working relationship that currently exists between the groups.

This alternative could also result in increased conflicts between hunters and ranchers, if ranchers reacted by closing off private lands to hunting.

The social well-being of approximately 418 ranch families would be negatively affected in the short term. In the long term, the social well being of approximately 176 families would be positively impacted, while 335 families would be negatively impacted.

Impacts to conservation and recreation would be beneficial under this alternative as viewed by concerned groups. Enhanced viewing and hunting experiences would accompany increases in wildlife numbers, especially in the short term. Protection of riparian areas and upland game bird nesting and strutting grounds through deferred grazing and mechanical treatments and protection of crucial winter habitat for the benefit of wildlife would also meet needs as seen by groups concerned with preserving wildlife and their habitat for intrinsic reasons. The amount of fencing planned may not be considered sufficient by some groups, however. Plans to minimize control of prairie dog towns and to fence off several proposed fishery reservoirs should also increase recreational and viewing opportunities on public lands.

Conclusions

Many ranchers in the area would be unaffected directly by this alternative. However, impacts resulting to some ranchers from loss of AUMs to watershed and wildlife enhancement might include possible loss of opportunity for income gain and a feeling of weakened control over the future. In addition, many ranchers interviewed indicated that implementation of an alternative emphasizing the protection of wildlife over the protection of the ranching industry could create feelings of resentment toward the BLM that might threaten future relations between the groups.

Impacts to wildlife and recreation groups should be beneficial, especially in the short term, as wildlife numbers are projected to increase due to improved vegetative productivity on watershed and wintering areas. Preservation of prairie dog towns and fishing reservoirs would also result in increased hunting and viewing experiences on public lands in the area.

Regional Economic Impacts

Appendix 4.9 shows the annual impact on output, earnings and employment of changes in livestock sales, range development construction, recreational expenditures and government employment. Impacts are shown in both the short and long term.

In the short term, the largest effect on earnings would be increased construction. There would also be a decrease in agricultural earnings. The only effect in the long term would be decreased livestock sales. Decreased earnings from this activity would amount to $231,000 annually and gross output resulting from livestock sales would decrease $943,000 annually.

Total employment would increase by 106 people in the short term and decrease by 23 persons in the long term. Total earnings would increase by $1,358,000 annually in the short term and decrease by $231,000 annually in the long term.

Conclusions

In the short term income would decrease by $589,306 annually on 418 operations (or 6.0 percent of the current livestock income for all ranches in the study). Permit values would show a net decrease of 19 percent and ranch employment an increase of eight percent. These short term decreases would be moderately significant.

In the long term income would increase by $90,938 annually on 176 operations and decrease by $481,435 annually on 335 operations in this alternative. The net change in ranch income would be a decrease of $390,547 annually (or four percent of the current livestock income for all ranches in the study). Permit values would show a net decrease of 13 percent and ranch employment a decrease of six percent. These long term increases and decreases are considered to be insignificant. These long term decreases would be moderately significant.

The changes in study area earnings (+0.8 percent in the short term and -0.1 percent in the long term) and employment (-0.6 percent in the short term, 0.1 percent in the long term) would be moderately significant.

There would be an irretrievable loss of ranch income in this alternative. A few ranches might be unable to stay in business in their present form. There would be no irreversible loss.

ALTERNATIVE C: NO GRAZING

No livestock would be permitted to graze on public lands in this alternative. The analysis of this alternative provides a basis of comparison for the environmental, social and economic consequences of the other alternatives.

All current grazing privileges would be revoked. All agreements with cooperative state grazing districts would be affected as well. No range improvements would be built or maintained unless the improvements were considered necessary for resource programs such as watershed or wildlife. Salvage rights would be granted or cash reimbursement made to ranchers who had contributed to range improvement facilities.

This program would eliminate the current permitted livestock use of 253,085 AUMs. In the "worst-case" situation, BLM would require fencing of public lands to prevent livestock trespass. There would be 7,400 miles of fences necessary for this undertaking, costing the private landowners $16.9 million according to 1980 cost estimates.

Watershed

Elimination of livestock grazing on public lands would bring about an immediate increase in vegetation residue and carryover, providing more cover and litter to the soil surface. An increase in soil productivity and development would occur, with an increase in levels of organic matter and increased soil moisture. In the long term, sediment yield would decrease 54% and water yield would decrease 30% (Table 4-3). Both would be significant decreases.

Water quality on public land would improve with the elimination of livestock grazing. Increased vegetation production on floodplain and riparian zones would result in lowered runoff and erosion. Reduced runoff would lower fecal bacteria, suspended sediment and nutrient loading of water sources. Increased riparian vegetation would improve stream channel stability and reduce erosion of stream banks and channels (Smeins 1975).

Prairie dog populations would be treated the same as in Alternative B. Noxious weeds will be treated as needed to protect private lands and crucial wildlife habitat.

TABLE 4.3
SUMMARY OF WATERSHED IMPACTS BY TREATMENTS AND FACILITIES
ALTERNATIVE C

Element	Sediment Yield (acre-feet/year) Initial	Sediment Yield (acre-feet/year) Long Term	Water Yield (acre-feet/year) Initial	Water Yield (acre-feet/year) Long Term	Water Quality	Consumptive Water Use by Livestock (ac-ft/year) Initial	Consumptive Water Use by Livestock (ac-ft/year) Long Term
Grazing Treatments	NA	NA	NA	NA	0		
Mechanical Land Treatments on 127,929 acres	NA	NA	NA	NA	0		
Range Facilities	0	I	0	I	0		
Water Developments	0	I	0	I	0		
Chemical Treatments							
Noxious Weeds	15	2	549	178	+		
Prairie Dogs	9	10	230	245	—		
Non-AMPs and Unalloted	1,133	521	59,291	41,826	0		
Total for Existing and Proposed AMPs	1,157	533	60,070	42,249	+	2,794	0

I — Insignificant
NA— Not applicable in this alternative
\+ — Increase in Water Quality
0 — No change in Water Quality
— — Decrease in Water Quality

SOURCE: BLM 1980-1981

Consumptive water use by livestock would be reduced from 2,794 acre-feet/year initially to zero in the implementation period. In the long term this quantity of water would be available to downstream users. Existing reservoirs would be maintained for uses other than for livestock.

Conclusions

The net effect of the elimination of livestock grazing on public lands would be a decrease in sediment yield of 54% in the long term (Table 4-3). Water yield would decrease by 30% in the long term, a significant decrease. Water quality would improve significantly with reduced levels of fecal bacteria, suspended sediment and nutrients contained in runoff water. The 2,794 acre-feet/year of water that would normally be consumed by livestock would be available to other users, including wildlife, recreation and downstream users.

There would be no irretrievable or irreversible loss to soil and water resources in this alternative.

Vegetation

Eliminating livestock grazing would bring about a rapid improvement in plant vigor and vegetation cover. Ecological range condition would improve in the long term as succession to ecological climax progressed with the more hardy grazing-resistant plant species giving way to less hardy "climax" species.

Some range sites would improve very slowly, but eventually would approach climax. Only those ranges in excellent condition now would not show marked improvement and even these would improve within that class.

Without the stimulation of grazing, plant vigor and production would level off and stagnate on most soils in the long term.

About 7,400 miles of fences would be needed to exclude livestock from public lands. Impacts common to construction and maintenance of fences to include construction of roads and trails would result. Livestock trailing along the fences could impact private and state lands, assuming ranchers continue to graze livestock on their lands.

Noxious weed and prairie dog control would be the same discussed in the watershed section. With limited control of prairie dogs, there would be a decrease in vegetation condition and production on or near prairie dog towns.

Conclusions

Ecological range condition of most range lands would improve while those occupied by prairie dogs would remain at or decline to poor. Plant vigor and vegetation cover would increase on areas not occupied by prairie dogs, but would then level off and stagnate. Fences required to exclude grazing would affect vegetation slightly.

The loss of vegetation production from the lower ecological range conditions brought about by the potential expansion of prairie dogs would be irretrievable but not irreversible.

Livestock

The elimination of livestock grazing on public land would cause a loss of any livestock production on ranches associated with public land grazing. This would amount to a loss of 253,085 AUMs.

The loss of grazing would reduce animal productivity on private and state lands, too, as livestock would have to trail to make use of the scattered private and state holdings. Livestock would be excluded from water, forage and shade areas on public lands and would trail along fence lines.

Conclusions

This alternative would eliminate stock use of the public lands and a loss of 100% of all grazing on ranches associated with the public lands. Livestock stress on non-public lands would increase and result in reduced productivity.

There would be a total irretrievable loss of permitted AUMs in this alternative but this would not be irreversible.

Wildlife

Big Game (Deer, Antelope and Bighorn Sheep)

In the short term, absence of grazing would result in an increase of forage and cover.

In the long term with the absence of livestock grazing, vegetation would trend toward a climax vegetation which is less desirable habitat for deer and antelope. Without cattle, periodic vegetative manipulations by fire, mechanical, chemical and/or other types of treatments could become necessary as a substitute for maintaining the suitability of some areas for big game. Therefore, cattle are important in maintaining on some soil subgroups the vegetation used by big game.

Riparian and woody draw habitats would improve in the absence of livestock grazing. However, vegetative manipulation by other than livestock grazing would be periodically necessary, as discussed above.

Without the need for division fencing on public lands, removal of such fences could improve big game movements. However, increased fencing to accommodate more intensive livestock management on private lands could offset the benefits of removing pasture fences on public lands. If BLM-administered lands were less scattered, perhaps actions on adjacent private lands would have less influence on public lands.

Without the availability of public lands for grazing, private landowners would guard the rangeland resources on their deeded land, possibly to the exclusion of big game and hunters.

Reintroduction of bighorn sheep into the Terry Badlands would be evaluated and implemented, if feasible. There is no present allocation of forage to livestock and that reservation for wildlife would be maintained as long as introduction efforts produce viable results. Such a program would be conducted in cooperation with the Montana Fish, Wildlife and Parks Department.

Upland Game Birds (Sharp-Tailed Grouse, Sage Grouse, Ring-Necked Pheasant)

With no livestock grazing, residual vegetation on all allotments would provide cover and food for additional upland game birds. As discussed in the previous section, maintaining vegetative succession in the more productive disclimax stages might have to be accomplished by fire, mechanical, chemical and/or treatments other than livestock grazing.

Turkeys

Management for wild turkeys would be provided through maintenance and improvement of habitats as the need and/or opportunities are identified. Treatments to accomplish this would include prescribed burning, plantings and mechanical methods of vegetation manipulation.

Waterfowl

In the absence of livestock, shoreline vegetation would improve, providing good nesting cover for waterfowl. Production and use would increase because of improved water clarity and additional food and cover on existing reservoirs. The absence of livestock grazing would also provide additional food and cover in streamside riparian habitats.

Livestock reservoirs with high to moderate waterfowl use potential would be maintained. Additional wetlands for waterfowl would be developed in moderate to high potential use areas as funding and maintenance capabilities allow.

Habitat improvements would have to be provided through artificial nesting structures and through vegetation manipulation by methods other than livestock grazing.

Nongame

Sufficient food and cover would be available to nongame on all public lands with the absence of livestock grazing. Range management fences around all public lands would provide additional perching sites for nongame birds. Nongame wildlife species would benefit from improvements in riparian and woody draw habitats. Vegetation manipulation by fire, mechanical and/or chemical methods might be necessary to maintain a disclimax which is a more biologically productive successional stage.

Shore birds would increase with the improvement of present shoreline vegetation.

Prairie dog controls would be necessary under this alternative to protect private lands and crucial wildlife habitats affected by expansions of existing towns. A study in Kansas (Snell and Hlavachick, 1980) demonstrated that grazing period modifications resulted in reductions of town size and prairie dog numbers on mid- to tall-grass prairie.

In the EIS area, similar livestock grazing adjustments would not likely produce similar results because of the short-grass species. However, the release of vegetation that would result from the absence of livestock grazing could be expected to limit or allow only slight increases in the acreage of prairie dog towns.

Fisheries

Livestock reservoirs with suitable fisheries potential would be maintained. Reservoir sites with a good potential for fisheries (e.g., Ten-Mile Creek) would be developed for that potential.

Conclusions

All wildlife habitats would improve dramatically in the short-term. In the long term, certain resultant successional changes (i.e., reversion of shrub ranges back to grasses) may not provide optimum big game forage production.

In the short term wildlife numbers would increase. In the long term, overall wildlife numbers would average higher than in Alternative A but may not average any higher than numbers anticipated an Alternative B. Cycle fluctuations above and below the long term average will still occur.

There would be no short-term or long-term irretrievable or irreversible adverse impacts to wildlife populations.

Cultural Resources

Cultural evidence is meaningful largely in relation to the degree that the site from which it comes has remained undisturbed. An artifact or feature might be important, but the association or context in which it was found might be much more significant. When these sites are disturbed, the opportunity for serious analysis by the archaeologist or historian is lost, as is important information about our past.

The elimination of livestock grazing on public lands would reduce natural destruction of some cultural sites by erosion, because of improved watershed and ecological range condition. There would be no threat to cultural properties from the construction of water developments and mechanical treatments.

Conclusions

There would be no adverse effects for cultural resources, but any cultural sites inadvertently destroyed would be irretrievably and irreversibly lost.

Social and Economic Impacts

Ranch Economic Impact

In this alternative all grazing on public lands would be eliminated in the short and long term on the 608 affected operations (Appendix 3.9). The average operation is 20 percent dependent on public grazing for its total requirement. For 89 operators (15 percent), this loss of public AUMs means a loss of more than 40 percent of their total ranch grazing. The loss for these operators would be greater than the 7 to 46 percent decreases as shown on the representative ranches. Total decreases in net annual income to all affected ranch operations would be approximately $3,221,668, a decrease of 36 percent from the current livestock total or 24 percent of livestock and farm income.

Elimination of federal grazing would reduce permit values for the 608 affected ranches by the full amount of their current value of $24,614,800. These decreases in permit value would have a detrimental effect on ranchers borrowing capacity and the sale value of affected ranches. For ranches that are heavily dependent on public AUMs, the overall reduction in ranch value could be considerably more than the $100 per AUM because elimination of federal grazing could virtually destroy the ranch as an economic unit.

Reduction in hired ranch employment that would be caused by total elimination of federal grazing permits is estimated to be the full time equivalent of 303 workers. This would be an 83 percent reduction from the current level of employment on the 608 operations. However, loss of jobs could be somewhat less than expected. Many operators would continue to employ the same number of workers because they could not reduce employees in small increments as AUMs were reduced.

Recreation/Wildlife Related Economic Impacts

There are no quantifiable impacts on game populations under this alternative. As such, there are no quantifiable changes in hunter use, expenditures, nor economic impact.

Social Impacts

Impacts resulting from this alternative would be significant and adverse in both the short and long terms with 100% of the area permit or lease holders affected by complete loss of BLM grazing privileges. Running reduced herds on base properties, purchasing hay, or simply taking a cut in income are considered to be the only feasible options available to ranchers to compensate for loss of public forage as additional private pasture to buy or lease in the area appears to be limited.

Impacts from loss of access to public grazing lands would be most adverse to small operators and to people just starting out in the ranching business, as many of them are barely managing to keep pace with inflation and rising interest costs as it is. For many of them, reduction in personal income and an accompanying drop in their overall sense of security could be expected to result. With one or two years of bad weather, negative impacts from loss of public forage would, of course, be magnified.

Although BLM regulations do not recognize the right to treat grazing permits as real property, bankers and realtors consider the permits to have value. One impact to ranchers, therefore, from loss of public AUMs would be the devaluation of the ranch property. That loss could result in added frustration for area operators in obtaining loans in the future. Consequently, opportunities for economic gain and thus opportunities for enhancement of social well being would be foregone.

Income reduction could also force operators and their families to seek off-ranch employment. For those ranchers who are advancing in age or who live 40 to 50 miles from the nearest town, however, the prospects of competing in a larger job market would be dim.

If a rancher could not afford to purchase hay or to reduce herd sizes and still maintain a viable operation, he might eventually have to quit the livestock business. Besides losing the business, he and his family would also suffer many intangible losses, such as loss of the opportunity to live a preferred lifestyle, loss of ancestral ties to the lands and possibly the breakup of extended families and close circles of friends.

For those ranchers with very limited dependence on federal lands, the loss of access to public land would likely create more of an inconvenience than it would a financial hardship. About one-third of the ranchers interviewed thought they might have to cut back herd numbers, but indicated the financial reverberations would likely be manageable. However, because of the dispersed pattern in which parcels of public land occur throughout their private holdings, these ranchers anticipated having to deal with the frustration of seeing their own holdings cut in half or broken up by fences, meaning some alteration of traditional management patterns would have to be made.

The expense of fencing public lands to keep cattle from trespassing would fall on the ranchers in the area. Material and labor costs could be prohibitive for some operators, especially those with numerous scattered parcels of public land.

Even though some ranchers could expect to suffer only limited impacts from loss of public forage, they would still likely sympathize with ranchers who they suspected would suffer more adverse impacts. Under this alternative, it could be expected that wholesale resentment toward BLM policies would grow and likely persist into the foreseeable future, eroding the good working relationship that presently exists. All ranchers interviewed expressed strong feelings toward traditional land uses in the area and would likely perceive loss of access to federal lands as increased government interference in the ranching industry and a real threat to their way of life. Being given sole responsibility for building and maintaining fences to close off access to public lands would also likely create feelings of hostility, as ranchers would be faced with the burden of carrying the costs of a program from which they were receiving no benefits.

Adoption of this alternative might also result in increased conflicts between hunters and ranchers as ranchers might react by closing their private land to hunting.

The social well-being of approximately 608 ranch families would be negatively affected by implementation of this alternative.

Wildlife groups that have expressed interest in public rangelands managed by the BLM have emphasized their commitment to multiple use of the public lands, with livestock considered a valid component of that multiple use. This alternative, therefore, could likely not meet the approval of either wildlife groups or recreationists. However, members of these groups would be in a position to experience beneficial impacts in the short term with increases in wildlife and upland game bird numbers, providing enhanced hunting and viewing experiences for the public. Protection of a viable population of prairie dogs for public use and to provide habitat for associated wildlife species would also meet the approval of conservation groups. In the longer term, however, it is expected that wildlife numbers would decrease, resulting in negative impacts to all groups concerned with preservation of wildlife on the public rangelands.

Conclusions

Social impacts resulting from complete loss of BLM grazing privileges in the resource area are, by their nature, difficult to quantify, and would vary from rancher to rancher, based on a ranch's present dependence on public lands. To some ranchers, loss of access to public land would pose little more than an inconvenience, forcing many of them to alter present management patterns. For many ranchers, loss of BLM grazing privileges could mean reductions in personal income and thus a lowering of their present standard of living. For some small operations and those highly dependent on public lands, loss of the use of public lands could result in a number of them being forced to sell out. In this event, loss of many important non-monetary aspects of the ranching lifestyle would also occur.

Erosion of the current good working relationship with BLM and increased resistance to recreational use of private lands would likely result.

Impacts to wildlife and recreational groups would be positive in the short term, as wildlife numbers increased with the initial removal of livestock from the public rangeland, allowing for increased hunting and viewing experiences.

These impacts would be reversed in the long term, however, as wildlife numbers would be expected to decline in the area.

Regional Economic Impacts

Appendix 4.11 shows the annual impact on output, earnings and employment of changes in livestock sales, range development, construction, recreationist expenditures and government employment. In the short and long term the greatest impact would be from decreases generated by a loss in livestock sales. These changes would result in a loss of $4,758,788 annually in earnings and 303 in employment.

Total employment would have a net decrease of 60 people in the short term and 303 people in the long term. Total earnings would decrease by $501,000 annually in the short term and $3,009,000 annually in the long term.

Conclusions

In the short and long term income would decrease on 608 operations in this alternative. The decrease in net ranch income would be 36 percent of the current total. Permit values would decrease by 100 percent and ranch employment by 83 percent. These impacts are considered to be highly significant.

The overall impact on the attitudes of ranching oriented residents would be extremely negative. Recreationists and environmentalists would be expected to hold more moderate views.

The short and long term direct and indirect decreases of 0.3 to 1.7 percent in study area earnings and employment would be considered moderately significant. The decreases in employment would be very severe locally.

ALTERNATIVE D: NO ACTION

The current range program would be "frozen" under this alternative. The 30 existing AMPs would continue on 227,776 acres, but no new AMPs would be implemented on the remaining 951,001 acres (747 allotments). No new range developments (e.g., reservoirs, fences, pipelines) would be constructed even in support of present AMPs. No changes in current levels of permitted livestock use would be allowed.

Initial and long term vegetation allocations would be the same: 253,085 AUMs for livestock, 759,255 AUMs for nonconsumptive and wildlife uses. No additional costs would be incurred as no new improvements or land treatments would be implemented.

All future options in range management would be foregone under this alternative. There would be no opportunity to correct erosion problems, increase or decrease livestock numbers, change kinds of livestock, adjust seasons-of-use, or improve range management. Little improvement would be expected on those AMPs where 50 percent of the allotment is in less than good condition.

The analysis shows future conditions in the area likely to occur as a result of continuing present rangeland trends.

Watershed

Without the option to make changes or adjustments in grazing treatments, stocking rates and seasons of use would result in a deterioration of watershed condition and water quality in the long term. Without the chance to change stocking rates, abuse or overgrazing of vegetation would decrease vegetation cover and cause accelerated erosion. Continuation of early season use without periodic rest or deferment would reduce vegetation cover through compaction of soils and would increase runoff and erosion in the long term. Accelerated erosion would decrease soil fertility and productivity, further reducing management options. The loss of the ability to make management changes in livestock grazing would result in moderately significant increases in sediment and water yields. Sediment yield would increase 15% in the long term and water yield would increase 12% (Table 4-4). Downstream users would benefit from water yield increases, but increases in sediment and water yield would decrease water quality from increased amounts of suspended sediment, nutrients and fecal bacteria in surface waters and increasing sediment loading of reservoirs and stream channels. Part of the increase in sediment and water yields would come from increases in the spread of noxious weeds and prairie dogs. Grazing pressure would intensify on noninfested areas. In the long term noxious weeds and prairie dogs would spread to cover a total of 14,000 acres, providing little, if any, desirable watershed cover.

Lack of new water sources would result in continued concentration and heavy use of vegetation by livestock near reservoirs and other water sources. Areas more distant from water would receive light use. Consumptive water use by livestock would remain at the current level of 2,794 acre-feet/year.

Conclusions

Without the ability to make modifications to grazing treatments, there would be moderately significant increases in sediment and water yields (Table 4-4). Sediment and water yields would increase with the spread of noxious weeds and prairie dogs. Sediment yield would increase by 15% and water yield would increase by 12% in the long term. Water quality would be reduced significantly in the long term due to increased sediment and water yields.

Consumptive use of water by livestock would remain at the current quantity of 2,794 acre-feet/year in the long term.

The loss of soil in this alternative due to erosion would be irretrievable but not irreversible. There would be no irretrievable or irreversible loss of water resources.

Vegetation

The current allocations and seasons of use would continue on allotments where early spring use is contributing to unsatisfactory resource conditions. Adverse impacts of early spring use would not be reduced by rest and deferment grazing treatments. This would result in a continuance of present unsatisfactory conditions and probably result in a downward trend in the long term, especially in floodplains, riparian zones and other livestock concentration areas.

The current grazing systems would be maintained. No revisions could be made to correct problems. Current trends would be expected to continue in the short term, but might decline in the long term, since there is no opportunity to make changes in response to problems. Many concentration areas would continue to be heavily grazed season long.

Sites suitable for mechanical treatments and soils responsive to grazing treatments would continue to produce far below their potential. Leafy spurge and other noxious weeds would spread and reduce range condition on the infested acres.

No prairie dog control measures would be taken on public lands. Livestock forage production would decrease in the long term due to the increase in prairie dogs.

Maintenance of current allocations and seasons of use without control of prairie dogs and noxious weeds would result in reduced forage supplies, overuse and deteriorated range condition.

Conclusions

This alternative would result in general maintenance of present trends and ecological range conditions in the short term and a significant decline in the long term. Since allocations to livestock would remain unchanged, a continuing decline in condition and productivity would result and the decline would be accelerated by increasing prairie dog populations.

The loss of vegetation production by lower ecological range conditions and the potential expansion of prairie dogs would be irretrievable but not irreversible.

TABLE 4.4
SUMMARY OF WATERSHED IMPACTS BY TREATMENTS AND FACILITIES

ALTERNATIVE D

Element	Sediment Yield (acre-feet/year) Initial	Sediment Yield (acre-feet/year) Long Term	Water Yield (acre-feet/year) Initial	Water Yield (acre-feet/year) Long Term	Water Quality	Consumptive Water Use by Livestock (ac-ft/year) Initial	Consumptive Water Use by Livestock (ac-ft/year) Long Term
Grazing Treatments	219	368	11,508	17,930	0		
Mechanical Land Treatments on 127,929 acres	NA	NA	NA	NA	0		
Range Facilities	NA	NA	NA	NA	0		
Water Developments	NA	NA	NA	NA	0		
Chemical Treatments							
Noxious Weeds	15	30	549	1,098	—		
Prairie Dogs	9	16	230	375	—		
Non-AMPs and Unalloted	913	913	47,869	47,869	0		
Total for Existing and Proposed AMPs	1,156	1,327	60,156	67,272	—	2,794	2,794

I — Insignificant
NA— Not applicable in this alternative
\+ — Increase in Water Quality
0 — No change in Water Quality
— — Decrease in Water Quality

SOURCE: BLM 1980-1981

Livestock

Current allocations would not change in the short or long term in this alternative, but forage supplies would be expected to decrease in the long term. Livestock production would remain fairly static in the short term. Long term reductions in forage supplies (see "Vegetation" above) would result in heavier grazing on some allotments if current use is continued. The loss of forage would probably be drastic on some allotments and minor on others. For example, those allotments which are stocked at lighter levels and have good range condition would be little affected, while an allotment with less good range would lose production. Those allotments with noxious weeds or prairie dogs would be especially hard hit.

There would be no change in seasons of use, grazing or land treatments in response to depleted forage supplies. Poor livestock distribution would continue where it presently exists and would contribute to lower animal production, especially under heavy grazing.

Conclusions

Production would remain static during the short term but would decline in the long term because of the spread of noxious weeds and prairie dogs and because of the lack of improved grazing management.

There would be no irretrievable or irreversible loss of livestock resources in this alternative.

Wildlife

Without the opportunities for vegetation manipulations, (e.g., additional water facilities, adjustments in grazing systems) some species of wildlife would be adversely affected. Livestock concentrations on crucial wildlife habitat would be significantly competitive with wildlife, particularly during the spring and winter seasons.

Big Game (Deer and Antelope)

Natural fluctuations of deer and antelope populations would occur, but there would be no long-term, significant increase or balance attained.

Conflicts between livestock and big game would remain and would increase in the long term.

Concentrated livestock use could not be corrected without range improvements to give better distributions of water and to subdivide pastures. Livestock concentrations on crucial winter ranges could be significantly competitive for big game forage.

Because of the freeze on developments, livestock impacts would remain concentrated on areas with water and highest vegetative production. In turn, some prime wildlife habitats (e.g., riparian and woody draw, sagebrush) could be heavily impacted by livestock concentrations.

Upland Game Birds (Sharp-Tailed Grouse, Sage Grouse, Ring-Necked Pheasant)

In the long term, no additional vegetation would be available for upland game birds from season long grazing treatments. Existing AMP allotments totaling 227,776 acres (19% of the public land in the EIS area), however, would help provide cover and food to sustain upland game bird populations.

Turkeys

Turkey populations inhabiting river bottom habitats would be adversely affected.

Without the capability to modify grazing systems through the development of improvement projects (i.e., water development and fencing) destructive use of riparian areas by livestock could not be prevented.

Waterfowl

No additional residual vegetation would be available to increase waterfowl production because of season long grazing. Even though the vegetative character of existing reservoirs would not be improved, some production of ducks and geese would still occur.

Nongame

No additional residual vegetation would be available to non-game. Some of the existing AMP allotments would provide residual cover because of completed development and continued management as prescribed in the AMP.

No additional cover or food would be available to shore birds on reservoir shorelines because of season long grazing.

Without prairie dog controls, expansion of towns would occur, particularly in areas where livestock would be concentrated. The potential increase in prairie dog towns would provide additional habitat for the burrowing owl, mountain plover and other species associated with prairie dogs. Potential habitat for the black-footed ferret would be increased. The potential expansion of the prairie dog towns, however, would reduce the yearlong food and cover of many other wildlife species not associated with prairie dog towns.

Fisheries

In the long term, vegetation removal around fisheries reservoirs would continue. Some of the existing reservoirs would be lost as viable fisheries because of accelerated sedimentation. No new reservoirs would be built in this alternative, decreasing the overall number of viable fisheries reservoirs in the long term.

Conclusions

Wildlife habitats would continue as they are currently trending. Without the capabilities to manage livestock use (water disper-

sion, fencing, etc.), livestock concentrations would locally deteriorate habitats. Riparian areas, hardwood draws and reservoir sites would probably be the most severely affected because of their water elements.

Locally, wildlife numbers would be significantly reduced; overall, average population levels of wildlife would be moderately reduced.

Without the capability to effect management changes, these trends would be both irretrievable and irreversible.

Cultural Resources

Cultural evidence is meaningful largely in relation to the degree that the site from which it comes has remained undisturbed. An artifact or feature might be important but the association or context in which it was found might be much more significant. When these sites are disturbed, the opportunity for serious analysis by the archaeologist or historian is lost as is important information about the past.

The inability to adjust grazing treatments and plan new range developments would result in long term accelerated soil erosion. The conditions which maintain the integrity of many cultural sites would therefore deteriorate.

Conclusions

The integrity of many cultural resources would deteriorate in the long term and any cultural sites inadvertently destroyed would be irretrievably and irreversibly lost.

Social and Ecomomic Impacts

Ranch Economic Impacts

In this alternative the present number of public AUMs would be authorized in the future, so at least "on paper," there would be no impacts. Range condition on public lands would deteriorate in the long term in many areas and, therefore, the real amount and quality of forage available to livestock would decrease.

The nature and extent of impacts cannot be projected because the BLM would not place additional controls on livestock grazing in this alternative.

There would probably not be any real impact on permit values because ranch operators would continue to show on paper the same number of AUMs authorized in the future as now. In some cases, however, the authorized amount of livestock forage would not be available. There probably would be some real impact on hired ranch employment, but this cannot be estimated because the BLM would not force any ranch operators to reduce the size of their livestock herds through grazing reductions.

Recreation/Wildlife Related Economic Impacts

There are no quantifiable impacts on game populations under this alternative. As such, there are no quantifiable changes in hunter use, expenditures, nor economic impact.

Social Impacts

Many ranchers who were interviewed anticipated that a no action alternative would eventually produce very negative impacts to their operations. It was expected that long-term deterioration of the public range due to lack of range improvements would eventually result, meaning less opportunity for income gain and a lowered standard of living for many ranchers in the area.

Difficulties in getting needed range improvements in the past has been very frustrating for some operators who were interviewed. Continued absence of new improvements, primarily water developments, and lack of controls on prairie dogs and weeds, would be interpreted by many respondents both as the loss of opportunity to improve operations in the future, adjusting for dry years, and as a threat to adjoining private lands. Ranchers interviewed overall do not consider a no action alternative to be good range management policy for livestock or wildlife and would likely grow to resent selection of this alternative if range conditions began to deteriorate in the future.

A primary concern of many wildlife and conservation groups is the rehabilitation and protection of public rangelands for the benefit of wildlife. A no action alternative likely would not meet the approval of most conservationists, since it would provide no extraordinary measures for protection of riparian areas and would not plan for any new AMPs. Wildlife numbers could be expected to decline in the long term if range conditions began to deteriorate, resulting in diminished hunting and viewing experiences on public lands.

Conclusions

Impacts to the ranching community would be adverse, particularly to those ranchers who are highly dependent on public lands, because of the continued absence of range improvements. Lack of controls on prairie dogs on public lands could also threaten adjoining private lands. The feelings of frustration that many ranchers have experienced in their attempts to get improvements and developments on their allotments would increase.

Wildlife numbers would be expected to decline in the long term, if range and watershed conditions deteriorated. This would result in negative impacts to those groups and individuals wanting to see wildlife preserved for intrinsic as well as consumptive uses.

Regional Economic Impacts

There would be no grazing adjustments in this alternative and therefore no quantified changes in expenditures, earnings and employment. In the long term deteriorating range conditions could have a real dollar impact on ranch income and therefore on the regional economy.

Conclusions

No changes in ranch income and employment can be quantified in this alternative. However, reductions in both are likely in the long term as forage production decreases. Therefore, long term reductions in income are a definite possibility.

There would be no quantifiable changes in expenditures so there would be no change in direct and indirect earnings and employment in the study area. There would also be no quantifiable changes in livestock numbers. The predicted long term deterioration of the range might, however, negatively affect study area earnings, employment and livestock numbers.

There would be no recognized irretrievable or irreversible loss in this alternative.

CHAPTER 5

CONSULTATION AND COORDINATION

The Big Dry Vegetative Allocation Draft Environmental Impact Statement was prepared by specialists from the BLM's Miles City District Office with assistance from BLM's Montana State Office. Disciplines and skills used to develop this EIS were: vegetation and rangeland use, animal husbandry, recreation, climate, sociology, economics, geology, hydrology, soils, cultural resources, wildlife, fisheries, graphics, editing, printing, public affairs and typing. Writing of the EIS began in June 1981 following a complex planning and data gathering process. The process included inventories of resources, public participation, coordination with other agencies and a planning effort. Consultation and coordination with agencies, organizations and individuals occurred throughout this process.

PUBLIC INVOLVEMENT AND CONSULTATION DURING DEVELOPMENT OF THE DRAFT EIS

An intense public participation process was conducted during the development of this EIS. An analysis document, a sampling of public opinion by interviews of people in the Big Dry Resource Area communities, a program to draw issues from the public and a notice in the "Federal Register" were all used to elicit public views on the EIS. This process also drew useful comments from other agencies.

The major portion of the public participation process was identifying issues which the public wanted considered in this EIS. This procedure consisted of the mass mailing of an information brochure, letter and return mailer asking for issues people felt should be considered in the Big Dry EIS. A summary of these reponses was provided in another brochure mailed to the original recipients.

Included with the first brochure was a schedule for public meetings held in Terry and Baker, Montana. The meetings were used to explain the EIS process, gather additional views and inform people of how the issues would be used. From this procedure, an alternative was designated the "preferred" alternative, namely, the Continued Development for Optimum Range Utilization.

As can be seen, the public's role was vital in the development of this EIS.

The Montana State Historical Preservation Officer (SHPO) was consulted and commented on this EIS. SHPO along with the Advisory Council on Historic Preservation, will have an opportunity to review the draft EIS.

Informal consultation with the U.S. Fish and Wildlife Service regarding threatened and endangered species also took place during the preparation of this EIS. Region 7 personnel of the Montana Department of Fish, Wildlife and Parks informally reviewed draft sections on wildlife and indicated that their comments were properly depicted in the EIS.

OTHER AGENCIES AND ORGANIZATIONS CONSULTED

The Big Dry EIS team consulted and/or received comments from the following during the preparation of the draft EIS:

Federal Agencies

Soil Conservation Service
Bureau of Indian Affairs
Fish and Wildlife Service
Geological Survey
National Weather Bureau

State Agencies and Organizations

Montana Agricultural Experiment Station
Montana Cooperative Extension Service
Montana Department of Fish, Wildlife and Parks
Montana Bureau of Mines and Geology
Montana Historical Society

County Commissioners and Planning Boards

Custer County
Dawson County
Fallon County
Garfield County
McCone County
Prairie County
Richland County
Rosebud County
Wibaux County

Special Interest Groups

Montana Stockgrowers Association
East Custer Cooperative State Grazing District (CSGD)
Red Butte CSGD
Prairie County CSGD

Further comments are expected from public hearings scheduled for the spring of 1982. Copies of the draft EIS will be available for public review at BLM Offices in Billings and Miles City and at public libraries in communities in the Big Dry area.

COMMENTS REQUESTED

Comments on the draft EIS have been requested from the following agencies, organizations and interest groups:

Federal Agencies

Advisory Council on Historic Preservation
Soil Conservation Service

Department of Defense
  U.S. Army Corps of Engineers
Department of Commerce
Department of the Interior
  Bureau of Indian Affairs
  Bureau of Mines
  Fish and Wildlife Service
  Geological Survey
  Bureau of Reclamation
Environmental Protection Agency

Congressional Offices

Office of Congressman Ron Marlenee
Office of Congressman Pat Williams
Office of Senator Max Baucus
Office of Senator John Melcher

State Agencies

Montana Association of State Grazing Districts
Montana Bureau of Mines & Geology
Montana Department of Community Affairs
Montana Cooperative Extension Service
Montana Department of Fish, Wildlife, and Parks
Montana Department of Health and Environmental Sciences,
  Water Quality Bureau
Montana Department of Natural Resources and Conservation
Montana Department of State Lands
Montana Governor's Office
Montana State Historic Preservation Office
Eastern Montana College
Montana State University
Old West Regional Commission
University of Montana

County Commissioners and Planning Boards

Carter County
Custer County
Dawson County
Fallon County
Garfield County
McCone County
Prairie County
Richland County
Rosebud County
Wibaux County

Other Organizations

Audubon Society
Circle Rifle Club
Custer Rod & Gun Club
Defenders of Wildlife
Farm Bureau
Friends of the Earth
Izaak Walton League
Lower Yellowstone Outdoors Association
McCone Agriculture Protective Organization
Montana Chamber of Commerce
Montana Farmers Union
Montana Pork Producers Assn.
Montana Public Lands Council
Montana Snowmobile Association
Montana Stockgrowers Association
Montana Woolgrowers Association
National Council of Public Land Users
Natural Resources Defense Council
Northern Plains Resource Council
Sierra Club
Society for Range Management
Wibaux Area Council
Wilderness Society
Wildlife Management Institute
Wildlife Society, Montana Chapter

Individuals

James Morgan (Plaintiff in Natural Resources Defense Council, Inc., et al. vs. Rogers C. B. Morton, et al.)

LIST OF PREPARERS

The following people put together this EIS:

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These people from the Montana State Office, BLM, assisted in the preparation of this EIS in various capacities:

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APPENDICES

APPENDIX 1.1: AGENCY RESPONSIBILITIES IN THE BIG DRY EIS AREA

The following agencies share regulatory or reviewing responsibility in the Big Dry EIS Area with BLM:

National Advisory Council on Historic Preservation (NACHP), and Montana State Historic Preservation Officer (SHPO)

Section 106 of the National Historic Preservation Act, and the National Historic Preservation Act Amendment of 1980 and Section 2b of Executive Order 11593 require that BLM consult with NACHP and SHPO, as outlined in 36 CFR 800 on actions that might affect cultural values on public lands.

Soil Conservation Service (SCS)

The SCS (U.S. Department of Agriculture) is primarily concerned with the stabilization of the soil and watershed resources and increasing the productivity of private land. To improve production on private land, the SCS has developed farm and ranch plan programs with such soil conservation projects as detention reservoirs and seeding. In ranch plan development, grazing systems are designed to use the private range effectively. In an integrated program, other rangelands such as public land must be considered. If the private ranch plan development should incorporate other uses on public land, conflicts would arise, particularly if use of public lands would be adjusted. SCS assistance on private lands is accomplished primarily through five soil and water conservation districts in or near the EIS area.

Through the Agricultural Stabilization and Conservation Service (ASCS), the Soil Conservation Service provides assistance to landowners who want to improve their private rangelands. The ASCS provides cost-sharing on fences, water developments, and erosion control; the SCS provides technical support in planning, surveying, designing, and laying out each project.

U.S. Geological Survey (USGS)

USGS (U.S. Department of the Interior) has jurisdiction over operational development of oil and gas deposits on public lands after BLM issues the lease.

Bureau of Reclamation

The Bureau of Reclamation has jurisdiction primarily along the Yellowstone and Missouri Rivers or other major water ways. Many lands along these major water ways were originally withdrawn from settlement, location and entry and placed under control of the Bureau with the enactment and passage of the Reclamation Act of June 17, 1902. This particular act established a system of water development projects for the irrigation of arid lands and for other purposes such as homesteading of public lands, if the land could be reclaimed through irrigation.

The Act allowed individuals to obtain patent to lands which had been withdrawn if certain conditions were adhered to and if the individual could prove up on his claim to validate a particular farm unit. Most landowners were able to obtain patent to their lands, however, the withdrawal which originally set aside public lands under the above act has never been formally revoked and remains a part of the permanent land record.

Cooperative State Grazing Districts

Organized under the 1933 Montana Grass Conservation Act, these nonprofit cooperative associations of livestock operators are empowered to lease or buy grazing lands, to develop and manage district controlled lands and to allocate grazing preferences among members and nonmembers. BLM has cooperative agreement with the following cooperative State Grazing Districts in the Big Dry Resource Area:

Prairie County
East Custer
Red Buttes

Environmental Protection Agency (EPA)

EPA is authorized under Section 309 of the Clean Air Act to review and evaluate environmental impact statements. Under Section 208, Federal Water Pollution Control Act, this agency also monitors water pollution control planning through the Montana Department of Health and Environmental Sciences with which BLM coordinates land use planning.

Fish and Wildlife Service

Fish and Wildlife Service (U.S. Department of the Interior) enforces the Endangered Species Act, manages migratory waterfowl, and monitors the aerial hunting of predators.

Montana Department of Fish, Wildlife and Parks

Fish, Wildlife and Parks is responsible for fisheries, big and small game species, and outdoor recreation. BLM has an agreement with Fish, Wildlife and Parks to maintain, manage, and improve wildlife resources in Montana.

Private Grazing Associations

These associations graze public lands in common, easing the management of allotments where there would otherwise be numerous permittees:

Cedar Creek Grazing Assoc.
Sage Hen Grazing Assoc.

Montana Department of State Lands

AMPs often contain varying amounts of state land. Approximately 6 percent of the area is composed of state land, the largest part of which is managed by the Montana Department of State Lands. State land, which often is intermingled with BLM land, is generally leased to individual livestock operators or cooperative state grazing districts on a long term basis. Coordination with the Montana Department of State Lands is continuing, as the department becomes increasingly involved in management planning and the development of range improvements.

APPENDICES

APPENDIX 2.1: PLANNING SYSTEM INTERRELATIONSHIPS

MFP Step 1 Recommendations for Range/Livestock	MFP Step 1 Recommendations for Other Resources That Conflict with Range/Livestock	MFP Step 1 Conflicts and Multiple Use Considerations	MFP Step 2 Recommendation	Resource Trade-Offs
RM 1.1 Consider 63 allotments for development and implementation of intensive grazing management through AMPs. Increase or decrease in vegetation allocation will be based on the long-term trend indicated in the SVIM range studies. A good or better range condition will be the management goal. RM 1.2 The area's 30 existing AMPs will be continued and periodically monitored to ensure allotments are maintained or improved to provide for good or better range conditions. RM 1.3 The remaining 684 allotments are composed of scattered tracts of public lands with a relatively low acreage ration of public lands to private lands. These areas do not warrant development of AMPs. No development will be planned.	WATERSHED WS 1.1, 1.2 Monitoring the effects of livestock use and the construction of range-related projects. Maintain good and excellent watershed condition while improving areas in poor and fair condition. Establish acceptable vegetative cover values by range site and implement them at the activity planning level. Surface disturbance from construction and maintenance of management facilities should not be allowed during wet periods to protect watershed values.	Where the effects of livestock grazing is deemed detrimental to watershed values, deferment, rotation or exclusion of livestock may be necessary.	Continue to monitor the effects of livestock grazing while improving range conditions to good or better. Surface disturbance for construction or maintenance on R/W's that involve significant public surface should not be allowed during wet periods.	Trade-offs are not determined at this time.
	WS 1.4 Evaluate existing roads and trails as to their use and condition. If a need cannot be shown, they should be closed. Discourage development of roads and trails unless a positive need can be shown. Confine off-road vehicles to established roads and trails.	The use of pickups, trailers and farming/ranching equipment is needed to do routine livestock related chores such as fence building and repairs and monitoring of livestock on public lands. This use often requires off-road travel.	Discourage development of roads and trails unless a positive need can be shown. Confine off-road vehicle use to established roads and trails in erosion susceptible areas. Close roads and trails in areas that are not needed.	Vehicles would not be allowed off established roads and trails, in areas of critical or severe conditions such as heavily eroded areas, newly reseeded areas or other areas in need of special management.
	WS 1.8 Examine poor and fair condition range using order I soil surveys and proceed to rehabilitate these areas with appropriate land treatments. Any increase in vegetation resulting from treatments are to be allocated for watershed purposes. No grazing should be allowed on treated areas for at least two growing seasons to allow vegetation establishment.	Deferment of rangelands for rehabilitation will require partial or total exclusion of livestock until vegetation can be established. This might include reductions, deferment or total exclusion of livestock grazing on poor or fair condition range until range is in good or better condition.	Complete order I soil surveys on problem areas and proceed with the recommended treatment to rehabilitate the areas. Any vegetation increase resulting from the treatments would be allocated 50% to watershed	Grazing will not be allowed on rehabilitated ranges for 2 growing seasons to allow vegetation establishment.

MFP Step 1 Recommendations for Range/Livestock	MFP Step 1 Recommendations for Other Resources That Conflict with Range/Livestock	MFP Step 1 Conflicts and Multiple Use Considerations	MFP Step 2 Recommendation	Resource Trade-Offs
	WS 2.1 Avoid grazing in severe wind and water erosion areas during April, May and June each year. Soil cover values are to be included in objectives of AMPs. Avoid reservoir, fence and other project construction during periods of wet weather to lessen impact severity on watershed values.	Grazing schedules necessitate that livestock graze public lands during April, May and June.	Where deemed necessary to graze livestock on severe wind and water erosion areas during the months of April, May and June, proper grazing management should be used in conjunction with soils, watershed and plant phenology capabilities. These should include rest, deferment or alternating use. Salting, construction of reservoirs, pipelines, and other range related projects in severe wind and water erosion areas should be discouraged.	In areas where critical or severe conditions exist, grazing will have to be more effectively managed, reduced or eliminated.
	WS 3.1 Discourage livestock use of riparian zones to reduce active streambank erosion, high suspended sediment concentrations and occasional high fecal coliform concentrations. Prevent grazing on floodplain and riparian areas during the wet periods of April, May and June. Accomplish by deferment or rest, fencing of floodplains i.e. treating them as separate grazing units and grazing them within the period of July 1 to March 31.	Either more intensive livestock management or fencing will be necessary on the identified areas in order to curb this problem. Season of use must be changed to allow vegetation to maintain plant growth and vigor during April, May and June.	Where deemed necessary to graze livestock on floodplain areas of April, May and June, proper grazing management should be used in conjunction with soil, watershed and plant phenology capabilities and requirements. Salting, construction of reservoirs, pipelines and other range related projects should be discouraged on floodplains and riparian areas.	Activity plans and AMPs must reflect proper grazing management systems during April, May and June. These may include deferment, reduction in season, rest rotation or other grazing systems to protect streambank stability, increase plant vigor and productivity and reduce sediments. If deemed necessary, riparian areas may be fenced to exclude livestock during critical periods.
	WS 3.4 Range improvements (other than reservoirs) generally will not be located in riparian habitats or floodplains. Salting would not be allowed in reservoir spillways. Fences will be constructed or designed to prevent the debris from collecting and closing channels.	The presence of water projects like reservoirs concentrates livestock on creek bottoms and riparian areas. These areas receive the heaviest vegetation use.	Same as WS 3.4	Wells may be located on terraces or ridgetops away from riparian areas. Pipelines will be located off riparian areas. Where projects are located on riparian habitat and floodplain areas, rehabilitation of the area is needed. Salting should be away from water and out of reservoir spillways.

MFP Step 1 Recommendations for Range/Livestock	MFP Step 1 Recommendations for Other Resources That Conflict with Range/Livestock	MFP Step 1 Conflicts and Multiple Use Considerations	MFP Step 2 Recommendation	Resource Trade-Offs
	WS 3.7 Eliminate all activities (including grazing) in the Lost Boy Creek Watershed (Prairie Planning Unit) that remove riparian vegetation and disturb the soil because this watershed yields very high suspended sediment and high flash peak flows. Special protective measures are needed if wilderness status is not obtained.	Natural erosion in this watershed is very severe. Grazing could only increase sediment yield on erosion while decreasing in water quality.	Allow livestock to graze Lost Boy Creek, but under a grazing system that does not deteriorate the vegetative cover. This system must include considerations for soil cover, compaction and plant phenology.	Livestock may be deferred from using the Lost Boy Creek drainage in early spring each year.
	WS 3.8 In the South Pine controlled ground water area, surface water (i.e. springs and reservoirs) will be the primary source of water for BLM water developments. All flowing wells will be controlled and use of ground water from a formation above the Fox Hills Formation will not be permitted.	The drilling of wells in the area is regulated by MDNRC in Helena, Mt. Use of aquifers in this area may result in decrease of water levels.	Same as WS 3.8	All flowing wells should be capped or controlled to prevent waste of Fox Hills aquifer water.
	WS 5.1, 5.2, 5.3 Monitor soil, climate, air surface and ground water on all AMPs to ensure protection of watershed values. This monitoring will include continuation of inventory on soils, water and air. Monitoring is needed to assure compliance with Montana's 208 Water Quality Program plans, court-mandated EISs, and SCS guidelines for livestock grazing.	Where livestock grazing is deemed harmful to soil or vegetation, protective measures of reduced grazing may be enacted.	Same as 5.1, 5.2, 5.3	No trade-offs are identified at this time.
	Wildlife WL 2.1 Acquire by purchase or easement, and/or exchange, lands along Ten Mile Creek to benefit wildlife and fisheries.	This proposed dam and reservoir (T11N, R51E, Sec. 34) is located on allotments 2815 and 2810. Grazing may be excluded or reduced.	Analyze important wildlife areas along with opportunities and capabilities of these areas. If they meet a demand, land acquisition programs should be initiated.	AUMs between livestock and wildlife may have to be adjusted on affected allotments to accommodate the Ten Mile Creek project if deemed important to wildlife.
	WL. 2.2, 2.3 Create wetlands by constructing water-control dikes, ponds, canals, level ditch, waterways, etc. for wildlife and waterfowl.	Range conflicts consist of creating a possible hazard to livestock if bog-type conditions occur.	Create wetlands habitat at suitable sites to enhance the prairie biome diversity.	Wetland areas may have to be fenced to exclude livestock. These areas may also lead to a small loss of livestock due to animals becoming bogged down.

MFP Step 1 Recommendations for Range/Livestock	MFP Step 1 Recommendations for Other Resources That Conflict with Range/Livestock	MFP Step 1 Conflicts and Multiple Use Considerations	MFP Step 2 Recommendation	Resource Trade-Offs
	WL 2.5 In cooperation with the Montana Dept. of Fish, Wildlife, and Parks, introduce bighorn sheep into the Terry Badlands area if it can be determined the area will support a viable population. No determinations of potential population size has been made, therefore vegetation allocation needs are not known. No new fencing of an extensive nature should be allowed. Maintain cattle as the only class of permitted livestock. Authorize no increases in livestock forage until bighorn use patterns and forage needs are established.	Approximately six sections of public lands are currently unallocated to livestock near the Terry Scenic Overlook. Since both bighorn sheep and cattle are primarily grazers, competition for forage would occur if sheep were to move off the allocated portions of public lands. This competition would be minimized as bighorn sheep prefer and need the steep slope areas for security and escape cover. Cattle use of these areas is minimal. Bighorn sheep would probably not stay within the six-section area, but would expand to fill the available habitat. Possible mix of domestic sheep with bighorn sheep might introduce the lung worm into the wildlife population. Bighorn sheep may contract some diseases (lung flukes) from domestic sheep. Allotments 2772, 2797, 2750 and 2747 will be affected.	Initiate cooperative evaluations with MT Dept. of Fish, Wildlife, and Parks and introduce bighorn into Terry Badlands, if introduction is deemed biologically practical. Maintain variable herd size which will not cause a decline in the quality and quantity of available habitat. Use control measures as needed to meet this end.	No conflicts are anticipated in the area as most of the area is unsuitable for livestock grazing.
	WL 3.3, 3.4 Plant aquatic, emergent and riparian vegetation along streambanks and waterways. With construction of new reservoirs and repair of existing reservoirs (with the exception of fisheries reservoirs), build goose nesting islands and/or install waterfowl nesting platforms or boxes as appropriate. No reservoirs are identified for this at present. Fencing may be necessary to accomplish this. This will establish food, water and cover for wildlife.	Conflicts exist if livestock is excluded from possible water sources.	Shallow ends of existing reservoirs would be fenced to protect planted vegetation. On new projects deemed suitable for fisheries, develop a livestock water source below the dam outside the fenced area. Require construction of nesting islands in new reservoirs and when repairing existing reservoirs. Fencing or rest rotation grazing system with a full one year rest on one pasture would provide residual nesting cover.	
	WL 3.9 Plant food and cover crops on sites managed intensively by provision of Habitat Management Plans (HMPs) for terrestrial wildlife populations. Plantings would be on a cooperative-share basis with irrigation if possible.	Range management is concerned about possible loss of productive haylands and AUMs by exclusion of grazing by livestock.	Same as WL 3.9 plus utilize irrigation and cooperative share crop farming where possible.	Livestock would be excluded from areas.

MFP Step 1 Recommendations for Range/Livestock	MFP Step 1 Recommendations for Other Resources That Conflict with Range/Livestock	MFP Step 1 Conflicts and Multiple Use Considerations	MFP Step 2 Recommendation	Resource Trade-Offs
	WL 4.4 In areas of critical wildlife habitat, restrict or limit occupancy for surface disturbances. This will include the construction of reservoirs, wells, fences and other livestock-related projects. Examples include grouse breeding areas, deer, grouse and antelope wintering areas and raptor concentration areas.	Reservoirs, fences, pipelines, waterspreaders and other projects are needed as part of the AMP process.	In known crucial wildlife habitat, restrict or limit occupancy for surface disturbance purposes. These restrictions may be in the form of zone protection or time-of-year limitations.	Livestock may be deferred during part of the year on areas of seasonal use by wildlife. Management facilities may have to be moved to less desirable locations (i.e., fences, wells, etc.) which still serve the same purpose.
	WL 4.6 Protect and maintain the black-tailed prairie dog ecosystem as an integral part of the prairie environment.	Range management conflicts would possibly occur with the allocation of vegetation and restrictions on range improvements on prairie dog towns.	(1) Allow surface disturbance in dog towns only when the town has been certified as black-footed ferret (endangered species) free. (2) Where watershed has not been harmed and range is not seriously depleted, prairie dog towns should be maintained. (3) Encourage the use of selective non-toxic control measures. Use chemical control only when the town has been certified free of black-footed ferrets.	Black-tailed prairie dogs may have to be poisoned periodically to prevent excessive expansion of towns to prevent damage of watershed and range.
	WL 4.8 Allocate 100% of shoreline vegetation within 100 feet of existing and future fisheries reservoirs to wildlife needs. Fence reservoirs to assure livestock exclusion.	Fencing of reservoirs would deny livestock access to water, plus there would be a small loss of AUMs.	As funds and manpower permit, fence existing fisheries reservoirs and leave water gaps for livestock to gain access. Develop water sources below dams.	AUMs will be lost to livestock where fenced.
	WL 4.10 Maximize production and improve the vigor of trees and shrub species in hardwood draws and riparian zones. These areas are identified in the MFP.	Protection of hardwood draws and riparian areas may conflict with livestock management systems.	In areas of good condition, maintain present management, where deterioration of the woody vegetation cover is occurring, institute grazing systems which will allow for regrowth to occur.	Grazing systems must be implemented to manage woody vegetation. Fencing may be necessary to exclude livestock from deteriorated areas.
	WL 4.11 Allocate sufficient vegetation to support identified mule deer, white-tailed deer and antelope numbers on spring, summer and fall range.	There is a potential conflict with livestock for vegetation allocation.	Same as WL 4.11	Potential loss of livestock AUMs to wildlife.

MFP Step 1 Recommendations for Range/Livestock	MFP Step 1 Recommendations for Other Resources That Conflict with Range/Livestock	MFP Step 1 Conflicts and Multiple Use Considerations	MFP Step 2 Recommendation	Resource Trade-Offs
	WL 4.12 Allocate 100% of all vegetation on deer, antelope and sage grouse winter range to wildlife in the MFP.	There is a potential conflict with livestock for vegetation allocation.	Continue present allocation of vegetation. If overuse occurs, institute a grazing system which would maximize shrub production. Minimize winter grazing.	Potential loss of livestock AUMs to cattle. Potential change of season of use.
	WL 4.13 Allocate 4 to 6 inches of residual growth of mid and tall grasses on a yearlong basis. This will provide nesting and escape cover for ground-nesting birds.	Potential conflict of allocation of vegetation and AUMs between wildlife and livestock.	Manage to obtain or maintain good ecological range condition. Where possible, institute rotation grazing systems which will allow for residual vegetation.	Potential loss of AUMs from livestock.
	WL 4.14 Locate and build fences to minimize restriction of wildlife movements. To the extent possible, locate fences in such a manner that they do not bisect crucial big game animal habitat or movement lanes.	Potential conflict with livestock management through distribution patterns.	Same as 4.14 with the addition that fences will be evaluated on a case-by-case basis.	This will allow for livestock management and minimize wildlife conflicts.
	WL 4.17 Prohibit the use of chemical toxicants and mechanical treatments immediately adjacent to streams or ponds.	May conflict with chemical and mechanical treatments proposed by range management to eliminate problem areas.	Adhere to watershed guidelines for setbacks of mechanical treatments. Assure that the Clean Water Act (PL 92-517) and USDI guidelines are adhered to where herbicides and pesticides are used.	Setbacks are needed where mechanical and pesticide treatments are used on rangelands.
	WL 4.18 Prohibit the indiscriminate spraying of noxious weed species on public lands.	Many weedy species, while beneficial to wildlife, may not provide forage for livestock.	Control weedy species on public lands (after analyzing their positive/negative values) using the most applicable and least damaging methods. By state law, some weed control is mandatory.	Without the spraying of noxious weeds on public lands, the weed problem will likely increase leading to a loss of rangelands and AUMs for livestock.
	WL 4.19 Prohibit the use of chlorinated hydrocarbons (DDT, Endrin, Dieldrin, etc.) to be used on insect species on public lands.	Uncontrolled grassphopper and cutworm infestations can severely deplete livestock forage.	BLM must comply with EPA regulations.	Possible continued insect problems on rangelands.

MFP Step 1 Recommendations for Range/Livestock	MFP Step 1 Recommendations for Other Resources That Conflict with Range/Livestock	MFP Step 1 Conflicts and Multiple Use Considerations	MFP Step 2 Recommendation	Resource Trade-Offs
	Cultural Resource Management CRM 1.7 Study selected sites through testing, data recovery and analysis to better understand the nature of cultural resources for management purposes.	Small areas will be taken out of grazing for short periods of time (less than three areas).	Study of selected cultural sites will continue. Small areas (100 sq. meters to 1000 sq. meters) will be taken out of production for short periods of time (rarely exceeding three months).	Trade-offs are expected to be very minimal.
	CRM 2.1, 2.4, 2.5, 2.6 Complete a class III cultural resources inventory on all livestock, development and management projects before the project may be approved. Nominate to the National Register those cultural resources which appear to qualify for placement on it.	If conflicts arise between the location of a significant cultural site and a proposed surface disturbing activity, the planned activity (e.g. range project construction) may be delayed or abandoned because of the presence of cultural material.	Continue on-the-ground search for cultural resources. Examine all livestock-related projects for cultural resource values.	Depending upon the significance of the cultural resources, a few livestock-related facilities may be abandoned or held up pending recording or salvage of cultural resources.
	Minerals M 2.1, 3.2, 4.1 Allow oil, gas and geothermal exploration and development on public lands. Explore and mine sand and gravel.	Exploration and development of oil and gas would temporarily diminish available AUMs for livestock. Possible water quality degradation for livestock.	Restrict activity up to 500 feet from reservoirs or intermittent streams and up to 1000 feet on perennial streams. Restrict oil and gas activities on rangeland steeper than 30%. Rehabilitate areas disturbed by seismic activities.	AUMs will be lost to seismic activity. Development would result in permanent loss of AUMs under roads, drill pads and possible lower water quality for livestock.
	Forestry F 3.1, 3.2, 3.3 Protect existing conifer and hardwood stands from significant depletion.	Conifer and hardwood growth suppresses vegetation needed for livestock (i.e. , grasses, forbs and shrubs). Removal of tree species may be recommended by range management as a tool to increase forage and AUMs on timber types.	Preserve timber in riparian areas while managing for maximum forest products.	Fire, chaining, herbicides may be used to increase forage for livestock. This must be on a case-by-case basis at the activity plan level.
	F 5.1 Restrict land use (i.e., grazing) on areas of seedling establishment. This is to allow new seedlings to become established without damage from trampling.	Livestock need shade and timber areas during hot or stormy weather. Fencing seedling establishment areas would reduce available forage for livestock.	Same as F 5.1	Livestock may be deferred from timbered areas until seeldings become established. Forestry/livestock conflicts and trade-offs are expected to be minimal.

APPENDIX 2.1

APPENDIX 2.2: METHODS AND RANGE DEVELOPMENTS

A. Description of Big Dry Area Soil and Vegetation Inventory (SVIM)

An extensive inventory of soils and vegetation of the Big Dry EIS area was conducted in 1979-80 using BLMs Soil and Vegetation Inventory Method (SVIM). The inventory included a total of 1.18 million acres of public land.

The objectives of the inventory were as follows:

1. To determine the ecological condition of the vegetation resource.

2. To inventory the soils of the area; to understand capabilities and potentials of the soil resource and to link vegetation to soils in order to determine the best management practices for the area.

3. To determine vegetation production, cover, trend and watershed condition in order to make appropriate allocations of vegetation.

4. To develop a base of resource information that could be added to and improved on in future years.

The inventory was conducted as follows:

1. Soil survey maps were used as a base. Published soil surveys were available for Dawson and Wibaux Counties. Copies of SCS photos with completed mapping were used for McCone, Richland and parts of Prairie and Rosebud Counties. A cooperative SCS-BLM effort mapped lands in Fallon and Custer and the remainder of Prairie County. BLM soil scientists mapped those portions of Rosebud and Garfield Counties in the survey area. The published soil surveys and the field photos were Order 2 surveys and the new surveys were Order 3. Range sites were noted on the base for each mapping unit.

2. Range condition and vegetation types were determined and assigned to a strata (each range site/condition class being called a strata) on the soils/range site maps. Helicopters were used to speed this operation as range conservationists estimated ecological range condition and mapped vegetation types while traversing the allotments slowly at altitudes of 10 to 15 feet. Observers landed periodically to check accuracy of estimates. By this method about 10,000 acres could be mapped in a day.

Two retired SCS personnel (range specialist and soil scientist) condition classed mapped the public lands in Richland, Dawson, Wibaux, Fallon, Prairie and Custer Counties in 1979. BLM soil scientists and range specialists mapped the vegetative condition of public lands in Garfield and Rosebud Counties and rechecked some of the previous years work in 1980.

About 450 transects were located on representative sites to sample all strata. The transects were assigned to the strata in the percentage that the strata occurred on the landscape (more transects were placed on the more abundant strata). An attempt was made to sample each strata at least three times, but some strata occurred very few times and were not sampled three times. Transect work was contracted and supervised by BLM range specialists and soil scientists. Time frames did not allow the use of automatic data processing of transect data. Soils, range site, condition class and vegetation mapping were used in conjunction with SCS range site and initial stocking rate guides to determine the current and potential (potential = production at mid-good condition) grazing capacities of the allotments. The results of these calculations are shown in Appendix 2.4. The present stocking rates (Alternative A Short-Term AUMs) are the result of the current condition acreage times the SCS guide value. The potential (Alternative A Long-Term AUMs) stocking rates are the result of site acres times mid-good values in the SCS guide.

B. The following are recommended methods of management and descriptions of range developments. These are provided to further clarify the proposed alternatives and provide guidance in the development of AMPs. Treatments discussed are those recommended in the respective management framework plans (MFPs).

1. Vegetation Allocation

Initial allocations in Alternative A and both short and long-term allocations in Alternative D are based on current stocking rates. These stocking rates would be verified by actual use and utilization monitoring and transects established on the various strata. The present allocation (Alternative A-Present Situation) is: 25% of vegetation to livestock and 75% of vegetation to nonconsumptive and wildlife uses. The allocation in Alternative B would allocate all vegetation on winter range and riparian zones plus the 75% allocation made in Alternative A to nonconsumptive and wildlife uses. The remaining vegetation would be allocated to livestock. Alternative C: 100% allocation to nonconsumptive and wildlife uses. Alternative D: Same as Alternative A: frozen present allocation.

2. Riparian Zone Management

Riparian zones in the area would be managed by grazing systems, alternative water sources, or fencing which would provide: periodic rest, reduced use, and opportunity for vegetation regeneration in Alternative A. Livestock use would be prohibited in Alternative B.

George D. Lea (1979) stated that: "Grazing and quality riparian systems are interrelated; grazing and riparian systems are not mutually exclusive." Also, "Presently, BLMs riparian management on rangelands consists of (1) grazing systems, such as rest-rotation and deferred-rotation grazing, (2) protective fencing, and (3) alternative sources of Water."

3. Grazing Treatments

Grazing treatments (systems) would vary and be keyed to the allotment situation and management needs. Livestock stress would be limited by designing systems with as few pastures as necessary and reducing handling requirements. Spring pastures would be developed in allotments when necessary and possible. Grazing systems may include rest rotation, deferred rotation, deferred, seasonal, short duration, other systems, or variations or combinations of these types.

4. Mechanical Treatments

Plowing and Seeding—This treatment would be applied after less destructive and costly measures have been applied. Rejuvenation of decadent stands of tame grasses, development of spring ranges, or returning areas of tame grasses to native range would use this technique.

Scalping, Contour Furrowing, Pitting, Chiseling, and Ripping—Would be done to increase ground cover, reduce runoff, increase vigor and abundance of vegetation. These methods could be used on soil Subgroups 1, 4, 5, 7, 9, 11, 12, and 13. They would not be used on steep slopes with erodable soils. Roads and trails would be excluded, scalping, contour furrowing and pitting would not be used on areas used by sheep. Interseeding would not be done unless there was an inadequate desirable species seed source (Ryerson 1970, Valentine 1971) or a vegetative conversion was desirable.

Chaining (Cabling, Railing), Dozing, Rotobeating—Could be used on soil Subgroups 1, 4, 5, 7, 9, 11, 12, and 13. Treatments would not be done on steep slopes with erodable soils. Large blocks of sagebrush could be cleared, but scattered stands would be left as needed for deer, antelope and sage grouse winter use. Work would not be done during the grouse nesting season (Valentine 1971).

Fire—Could be used on soil Subgroups 1, 2, 4, 5, 7, 9, 10, 11, 12, and 13. Treatment would avoid steep erodable areas and resource considerations would be made during the burn plan preparation.

5. Range Facilities

Fencing would consider wildlife needs and would provide for its movement. Range improvements (except reservoirs, pits or developed springs) would be located off floodplains, riparian areas, or crucial wildlife habitat if possible. Developments would not take place on damage susceptible soils when they are saturated, generally April-June.

Oilers, salt and minerals would be located together, away from riparian zones and close enough to upland water sources to be used by livestock.

5. Water Developments

Water Sources—These include wells, springs, pits and reservoirs. There would be one water source per square mile on AMPs and one per two square miles on non-AMPs. Where livestock are excluded, tanks would be located away from the dam for watering. Topsoil would be saved to place on the dam fill. Water sources would be located carefully to protect special habitat zones.

Water Quality—The water quality of stock water and fishing reservoirs on public lands would be managed to meet the state of Montana and federal water quality standards for the designed purpose of the reservoir. Methods to improve water quality include development of AMPs, mechanical treatments and grazing treatments that reduce grazing intensities and maintain vegetation cover on watershed.

Vegetation cover promotes water infiltration, reducing overland flow that carries sediment, nutrients, fecal bacteria and other water pollutants to surface water sources.

7. Noxious Weeds

Would be controlled in Alternatives A, B and C. Tordon beads work well on leafy spurge. They can be hand spread or mechanically spread depending on conditions. Several applications may be necessary. Other methods of effective control may be developed and used. Other noxious weeds can be controlled with a variety of chemical herbicides which would be applied in compliance with specifications and regulations.

8. Prairie Dog Control

Zinc phosphide is the only pesticide presently considered for control. An accepted procedure is to prebait active holes prior to application of poison bait. One teaspoon per hole is the recommended rate of application. Baiting should be done in late summer or fall. Mechanical treatment of controlled dog towns may be necessary.

9. Monitoring

Monitoring plans would be developed to ensure that resource objectives are being met by management (Table 1-3). Benchmark or comparison sites would be established and monitored for comparison with general rangelands.

APPENDIX 2.3: ALLOCATION COMPUTATIONS

The acreage and range condition of each range site provided the base for making projections of increased grazing capacity in response to management. The following procedures were used to establish the short and long term allocation in each alternative.

Alternative A: Continuation of Present Management

Short Term: The present allocation was used. It was originally developed by applying proper use factors, actual use values, and the initial stocking rate guides found in SCS Technician Guides. The allocation is closely approximated by the formula: Grazing Capacity = Site Production x .25 ÷ Monthly Forage Requirement. The initial vegetation allocation was: 25% to livestock, 75% to wildlife, range land maintenance and other nonconsumptive uses.

Example:

A site with an average annual production of 1200 lbs/acre would be allocated as shown below:

$$\frac{1200 \text{ lbs}}{800 \text{ lbs}} \times .25 = \frac{300 \text{ lbs}}{800 \text{ lbs}} = .375 \text{ AUMs/acre allocated to livestock}$$

The remaining 900 lbs or 1.125 AUMs/acre were not allocated to livestock and were allocated to wildlife and nonconsumptive uses as discussed above. The high percentage of good and excellent range in the EIS area verifies the adequacy of the guides and the formula. Those areas in less than good conition are generally the result of some management problem (primarily caused by livestock distribution resulting from water, fencing, tame pasture, repeated same season grazing, etc.) which results in overuse of an area; not in an overallocation of vegetation.

Long Term: The allocation is the new grazing capacity which would result from a projected increase in range condition on less than good range and the increase in production of tame pasture (primarily crested wheatgrass) by rejuvenation or reseeding to other species.

Alternative B: Watershed and Wildlife Enhancement

Short and long term allocations were achieved by subtracting the watershed and wildlife MFP I demands from the short and long term allocation in Alternative A.

The watershed demand was that use of areas susceptible to damage during April, May & June be restricted and total rest of riparian areas. Aums reduced are those that would be lost without a change in the current grazing use schedule.

The wildlife demand was for all vegetation on antelope, deer, and sage grouse critical winter ranges, and for all vegetation on prairie dog towns. These AUMs are in addition to the allocation made in Alternative A and are purely theoretical as all the wildlife demands have been more than met by the present allocation, with the exception of the demand for all vegetation on prairie dog towns.

Alternative C: No Grazing

No allocation to livestock in either the short or long term.

Alternative D: No Action

Continuation of current allocation in both the short and the long term.

APPENDIX 2.4: ALLOTMENT SUMMARIES

EXISTING AMPS

RECORD NUMBER	ALLOT NUMBER	PUBLIC ACRES	OTHER ACRES	PUBLIC LAND RANGE CONDITION E+G	FAIR	POOR	UNKNOWN	TP	# & CLS		SEASON	% PUBLIC	CURRENT USE PUBLIC AUMS	OTHER AUMS	POTENTIAL AUMS	PUBLIC ALTN. A ST	ALTN. A LT	ALTN. B ST	ALTN. B LT	ALTN. C ST	ALTN. C LT	ALTN. D ST	ALTN. D LT
2084	100	8753	62796	8413	340	--	--	--	229	Y	06/16-09/23	88	659	90	690	659	690	529	560	0	0	659	659
	101								3	C	03/01-02/28	100	30	--	30	30	30	00	00	0	0	30	30
											TOTAL		689	90									
2549*	50	9169	42967	7837	474	--	--	858	110	C	03/01-02/28	100	1308	--	2264	2235	2264	2114	2143	0	0	2235	2235
2685	183								115	C	04/01-11/30	100	927	--									
											TOTAL		2235										
2550*	51	3586	10737	2593	729	--	264	--	3	H	03/01-02/28	15	4	28	1014	948	1014	936	1002	0	0	948	948
2686	184								420	C	03/01-02/28	15	756	4287									
									47	C	05/01-08/31	100	188										
											TOTAL		948	4315									
2568*	69	3200	9263	2771	--	--	--	429	65	C	03/01-02/28	100	785	--	838	785	838	550	603	0	0	785	785
2832	330	6708	2877	5838	690	--	70	110	62	C	03/01-02/28	100	743	--	1804	1742	1804	1742	1804	0	0	1742	1742
									200	C	05/01-06/15	82	246	54									
									239	C	08/01-08/30	82	195	44									
									162	C	08/01-08/30	81	132	30									
									250	C	09/01-11/03	81	426	99									
											TOTAL		2527	227									
2727	224	6575	1990	5795	170	--	--	610	45	C	05/01-09/30	94	212	14	212	212	212	186	186	0	0	212	212
	225								117	C	03/01-02/28	100	1409	--	1409	1409	1409	1234	1234	0	0	1409	1409
											TOTAL		1621	14									
2728	226	3747	2160	3209	410	--	90	38	205	C	03/15-11/14	63	1033	607	1117	1033	1117	933	1017	0	0	1033	1033
2737	235	10826	10282	9856	30	--	40	900	247	C	03/02-02/28	53	1574	1396	2837	2722	2837	1815	1930	0	0	2722	2822
									900	S	03/01-02/28	53	1148	1018									
											TOTAL		2722	2414									
2738	236	2820	7009	2220	530	--	70	--	4	C	03/01-02/28	100	45	--	812	765	812	415	462	0	0	765	765
									140	C	04/01-05/31	100	280	--									
									142	C	07/01-09/15	100	355	--									
									43	C	05/01-08/31	50	85	85									
											TOTAL		765	85									
2745	244	8417	13383	7357	140	--	--	920	510	C	03/01-02/28	38	2349	3771	2475	2349	2475	2233	2359	0	0	2349	2349
2750	249	23324	13277	21834	--	610	--	880	266	C	03/01-02/28	100	3187	--	3325	3187	3325	2327	2465	0	0	3187	3187
2752	251	3673	4264	3673	--	--	--	--	4	C	03/01-02/28	100	41	--	939	939	939	589	589	0	0	939	939
									164	C	05/01-11/30	51	587	561									
									400	S	05/01-11/30	51	286	274									
									7	H	05/01-11/30	51	25	17									
											TOTAL		939	852									
2755	254	11787	8050	11097	350	--	30	310	204	C	03/01-02/28	100	2443	--	2509	2443	2509	2354	2420	0	0	2443	2443
2762	262	4315	903	4315	--	--	--	--	160	C	04/16-11/30	91	1093	108	1093	1093	1093	1071	1071	0	0	1093	1093
2763	263	10244	11422	10024	--	--	--	220	556	C	04/01-05/25	92	925	80	2695	2667	2695	2286	2314	0	0	2667	2667
									556	C	05/26-08/25	74	1167	410									
									556	C	08/26-11/10	27	325	876									
									5	H	03/01-02/28	90	54	6									
									556	C	04/01-04/07	90	113	13									
									556	C	11/11-02/28	9	83	9									
											TOTAL		2667	1394									
2772	268	17304	19029	15944	990	--	--	370	766	C	05/01-12/15	72	4152	1615	4152	4152	4152	3960	3960	0	0	4152	4152
2773	269	6406	4133	5006	--	--	150	1250	141	C	03/01-02/28	100	1695	--	1710	1695	1710	1238	1253	0	0	1695	1695
2774	270	6958	6286	6098	80	--	340	440	154	C	03/01-02/28	100	1845	--	1858	1845	1858	438	451	0	0	1845	1845

EXISTING AMPS (cont.)

RECORD NUMBER	ALLOT NUMBER	PUBLIC ACRES	OTHER ACRES	PUBLIC LAND RANGE CONDITION E+G	FAIR	POOR	UNKNOWN	TP	# & CLS		SEASON	% PUBLIC	CURRENT USE PUBLIC AUMS	OTHER AUMS	POTENTIAL AUMS	PUBLIC ALTN. A ST	ALTN. A LT	ALTN. B ST	ALTN. B LT	ALTN. C ST	ALTN. C LT	ALTN. D ST	ALTN. D LT
2786	282	3640	1530	2360	600	--	120	560	125	C	05/01-10/31	100	750	--	1165	1041	1165	1041	1165	0	0	1041	1041
									30	C	06/01-10/31	100	150	--									
									7	C	06/19-09/18	100	21	--									
									20	Y	05/01-10/31	100	120	--									
											TOTAL		1041	--									
2792	288	8599	14617	7649	950	--	--	--	142	C	03/01-02/28	100	1703	--	1766	1703	1766	1566	1629	0	0	1703	1703
2793	289	4465	2880	3465	--	--	420	580	150	C	10/11-04/30	27	271	719	960	887	960	800	873	0	0	887	887
									150	C	05/01-10/10	77	616	184									
											TOTAL		887	907									
2803	299	8512	1280	7572	770	--	--	170	473	C	05/01-10/31	88	2499	339	2589	2499	2589	2436	2526	0	0	2499	2499
2807	303	1520	1040	220	860	--	--	440	5	C	03/01-02/28	100	65	--	581	450	581	424	555	0	0	450	450
									72	C	04/01-09/15	97	385	12									
											TOTAL		450	12									
2824	323	5840	2679	4830	110	--	40	860	141	C	05/01-10/31	85	721	127	1623	1506	1623	1492	1609	0	0	1506	1506
2826	323								119	C	04/25-10/31	85	632	112									
									60	Y	08/01-10/31	85	153	27									
											TOTAL		1506	266									
2828	326	3361	960	3271	--	--	--	90	5	C	03/01-02/28	100	52	--	764	752	764	695	707	0	0	752	752
									100	C	04/15-11/14	100	700	--									
											TOTAL		752										
2829	327	1971	5524	81	850	00	150	890	252	C	04/01/12/20	25	519	1557	707	519	707	519	707	0	0	519	519
2831	329	4213	2051	3723	50	--	20	420	205	C	03/01-03/31	27	56	151	1091	1034	1091	670	727	0	0	1034	1034
									204	C	04/01-05/14	3	9	291									
									204	C	05/15-09/30	75	694	231									
									205	C	10/01-02/28	27	275	744									
											TOTAL		1034	1417									
2838	336	8837	4280	8837	--	--	--	--	470	C	04/20-11/20	63	2074	1216	2074	2074	2074	1885	1885	0	0	2074	2074
2861	356	5496	2986	4356	700	--	40	400	310	C	05/15-09/14	100	1239	--	1243	1239	1243	567	571	0	0	1239	1239
2873	363	9502	7585	7852	530	--	70	1050	200	C	03/01-02/28	100	2404	--	2583	2404	2583	2354	2533	0	0	2404	2404
2946	436	14008	24732	13928	80	--	--	--	1001	Y	05/01-10/31	80	3216	1201	3223	3216	3223	3020	3027	0	0	3216	3216

PROPOSED AMPS

RECORD NUMBER	ALLOT NUMBER	PUBLIC ACRES	OTHER ACRES	PUBLIC LAND RANGE CONDITION E+G	FAIR	POOR	UNKNOWN	TP	# & CLS	SEASON	% PUBLIC	CURRENT USE PUBLIC AUMS	CURRENT USE OTHER AUMS	POTENTIAL AUMS	PUBLIC ALTN. A ST	A LT	ALTN. B ST	B LT	ALTN. C ST	C LT	ALTN. D ST	D LT
2003	4	2364	11040	1664	280	--	--	420	63 C	03/01-02/28	100	757	--	822	757	822	757	822	0	0	757	757
2098	116	1478	9784	958	520	--	--	--	33 C	04/01-11/30	100	264	--	311	264	311	243	290	0	0	264	264
2109	130	2920	9960	2920	--	--	--	--	1 C	03/01-02/28	100	14	--	14	14	14	0	0	0	0	14	14
	131								48 C	03/01-02/28	100	573		573	573	573	468	468	0	0	573	573
										TOTAL		587	--									
2131	156	869	5720	604	265	--	--	--	10 C	03/01-02/28	100	121	0	145	121	145	116	140	0	0	121	121
2144	168	48330	217659	45550	2360	420	--	--	650 C	03/01-02/28	29	2259	5531	7981	7704	7981	7154	7432	0	0	7704	7704
	168								600 Y	04/15-09/15	29	870	2130									
	169								812 C	03/01-02/28	21	2057	7738									
	170								787 C	03/01-02/28	8	764	8786									
	171								1639 C	03/01-02/28	9	1754	17735									
										TOTAL		7704	41920									
2217	256	1232	14704	232	1000	--	--	--	170 S	03/01-02/28	100	410		500	410	500	373	463	0	0	410	410
2219	258	1183	1200	863	185	135	--	--	19 C	05/01-12/31	100	152		195	152	195	131	174	0	0	152	152
2223	262	6700	28137	5950	750	--	--	--	355 C	11/01-04/30	30	640	1490	1514	1460	1514	1054	1108	0	0	1460	1460
									100 C	05/01-10/31	30	180	420									
									127 C	11/01-04/30	35	267	496									
									100 Y	03/01-02-28	35	315	585									
									144 C	11/01-04/30	6	52	814									
									1 C	03/01-02/28	100	6										
										TOTAL		1460	3805									
2225	264	520	4260	232	288	--	--	--	160 C	04/16-11/15	16	180	945	202	180	202	11	33	0	0	180	180
2239	280	4633	11807	4443	190	--	--	--	359 Y	05/01-09/30	23	310	1035	414	397	414	92	109	0	0	397	397
									7 C	03/01-02/28	100	87	--									
										TOTAL		397	1035									
2257	298	7040	25442	6260	780	--	--	--	574 C	03/01-02/28	100	1378	--	1430	1378	1430	1216	1268	0	0	1378	1378
2292	329	4773	21042	4603	170	--	--	--	517 C	04/10-11/30	9	372	3761	390	372	390	52	70	0	0	372	372
2351	396	1161	2097	618	525	18	--	--	16 C	03/01-02/28	100	186	--	237	186	237	143	194	0	0	186	186
2377	425	8449	51081	7929	520	--	--	--	87 C	03/01-02/28	100	1044	--	1091	1044	1091	933	980	0	0	1044	1044
2514*	15	4260	18553	1851	2339	--	--	70	30 C	03/01-04/30	100	60	--	1169	1044	1169	811	936	0	0	1044	1044
									230 C	05/01-12/15	36	620	1102									
									70 C	05/01-12/15	20	105	420									
									133 C	06/01-11/30	21	170	640									
									30 C	12/16-02/28	100	76	--									
									8 H	03/01-02/28	14	13	80									
2675	173	79		79	--	--	--	--	6 C	05/01-12/15	36	16	28	16	16	16	16	16	0	0	16	16
2805	301	640		640	--	--	--	--	62 C	06/01-12/01	21	80	301	80	80	80	74	74	0	0	80	80
										TOTAL		1140	2571									
2547*	48	12248	32954	7539	4639	--	70	--	713 C	03/01-02/28	26	2223	6327	3419	3120	3419	2839	3138	0	0	3120	3120
									18 H	03/01-02/28	26	57	162									
2684	182	4640	6880	4640	--	--	--	--	262 C	03/01-02/28	26	819	2331									
									7 H	03/01-02/28	26	21	60									
										TOTAL		3120	8880									
2551	52	4799	9751	4139	660	--	--	--	41 C	03/01-02/28	100	488	--	1036	980	1036	478	534	0	0	980	980
									101 C	05/01-11/01	81	492	115									
										TOTAL		980	115									

PROPOSED AMPS (cont.)

RECORD NUMBER	ALLOT NUMBER	PUBLIC ACRES	OTHER ACRES	PUBLIC LAND RANGE CONDITION E+G	FAIR	POOR	UNKNOWN	TP	# & CLS		SEASON	% PUBLIC	CURRENT USE PUBLIC AUMS	CURRENT USE OTHER AUMS	POTENTIAL AUMS	PUBLIC ALTN. A ST	ALTN. A LT	ALTN. B ST	ALTN. B LT	ALTN. C ST	ALTN. C LT	ALTN. D ST	ALTN. D LT
2555	56	3240	8142	1742	1498	--	--	--	50	C	03/01-02/28	100	601	--	736	601	736	592	727	0	0	601	601
2558*	59	10532	34405	9764	768	--	--	--	110	Y	06/01-11/15	21	95	362	1898	1865	1898	1374	1407	0	0	1865	1865
									990	C	06/01-11/15	21	1143	4302									
									35	H	06/01-11/15	21	41	152									
									49	C	03/01-02/28	100	586	--									
2747	246	24514	7091	20464	3900	--	90	60	110	Y	11/16-05/31	47	252	288	4736	4522	4736	3214	3428	0	0	4522	4522
									990	C	11/16-05/31	47	3024	3411									
									35	H	11/16-05/31	47	107	121									
									95	C	03/01-02/28	100	1139	--									
											TOTAL		6387	8636									
2590	90	800	2080	--	704	--	--	96	60	C	05/01-10/01	73	221	82	296	221	296	203	278	0	0	221	221
2591	91	1261	1454	704	448	--	--	109	75	C	05/01-10/31	66	297	153	351	297	351	24	78	0	0	297	297
2624	122	1200	2820	58	680	--	128	334	28	C	03/01-02/28	100	338	--	441	338	441	141	244	0	0	338	338
2626	124	1651	5009	26	1612	--	13	--	10	C	03/01-02-28	100	120	--	636	505	636	489	620	0	0	505	505
									162	C	06/15-11/20	46	385	452									
											TOTAL		505	452									
2651	149	1230	3280	276	726	--	--	228	28	C	03/01-02/28	100	336	0	437	336	437	336	437	0	0	336	336
2672	170	1411	2023	451	330	--	--	630	105	C	03/01-02/28	37	468	797	576	468	576	468	576	0	0	468	468
2676*	174	1000	2074	316	32	--	--	652	60	C	10/25-02/28	100	247	--	329	247	329	247	329	0	0	247	247
2808	304	6274	9251	5014	590	210	--	460	10	C	03/01-02/28	100	116	--	1447	1344	1447	1263	1366	0	0	1344	1344
									120	C	06/15-10/24	92	478	42									
									380	C	03/15-06/14	15	170	963									
									260	C	06/15-10/24	52	580	535									
											TOTAL		1591	1540									
2682	180	4595	1330	3526	966	--	--	103	251	C	06/01-11/30	77	1160	345	1221	1183	1221	1176	1214	0	0	1183	1183
									12	C	06/15-08/30	77	23	7									
											TOTAL		1183	352									
2691	189	2710	4808	2550	--	--	--	160	221	C	03/01-02/28	22	584	2071	610	590	610	550	570	0	0	590	590
									2	H	03/01-02/28	22	6	21									
											TOTAL		590	2092									
2744	243	4551	2160	4041	--	--	250	260	23	C	03/01-02/28	100	270	--	1287	1254	1287	1160	1193	0	0	1254	1254
									230	C	07/15-10/24	89	684	85									
									75	C	06/01-09/30	100	300	--									
											TOTAL		1254	85									
2748	247	2283	2400	2083	--	--	80	120	117	C	03/01-03/31	13	15	100	705	690	705	684	699	0	0	690	690
									117	C	04/01-10-15	78	594	168									
									117	C	10/16-02/28	13	69	462									
									1	C	03/01-02/28	100	12	--									
											TOTAL		690	730									
2802	298	5801	3127	5151	190	--	--	460	1	C	03/01-02/28	100	9	--	1868	1772	1868	1732	1828	0	0	1772	1772
									94	C	04/15-10/31	92	565	49									
									1000	S	05/01-11/15	92	1198	104									
											TOTAL		1772	153									
2804*	300	6006	10424	5186	820	--	--	--	213	C	11011-05/30	50	746	746	1352	1279	1352	1235	1308	0	0	1279	1279
									213	C	06/01-09/30	63	533	313									
2960	450	7261	15840	7261	--	--	--	--	106	C	03/01-02/28	100	1271	--	1271	1271	1271	599	599	0	0	1271	1271
											TOTAL		2550	1059									
2810	306	1923	960	1763	160	--	--	--	45	C	04/15-12/14	88	319	44	319	319	319	278	278	0	0	319	319

PROPOSED AMPS (cont.)

RECORD NUMBER	ALLOT NUMBER	PUBLIC ACRES	OTHER ACRES	PUBLIC LAND RANGE CONDITION E+G	FAIR	POOR	UNKNOWN	TP	# & CLS	SEASON	% PUBLIC	CURRENT USE PUBLIC AUMS	CURRENT USE OTHER AUMS	POTENTIAL AUMS	PUBLIC ALTN. A ST	PUBLIC ALTN. A LT	PUBLIC ALTN. B ST	PUBLIC ALTN. B LT	PUBLIC ALTN. C ST	PUBLIC ALTN. C LT	PUBLIC ALTN. O ST	PUBLIC ALTN. O LT
2815	312	4716	4516	2796	340	--	--	1580	4 H	03/01-02/28	37	17	29	1320	1092	1320	1065	1293	0	0	1092	1092
									246 C	04/01-07/15	37	316	538									
									246 C	09/01-11/15	37	225	383									
									246 C	11/16-03/31	36	401	8130									
									246 C	07/16-08/31	36	133	236									
										TOTAL		1092	1899									
2816	313	7119	5351	6439	390	--	--	290	304 C	11/01-03/31	7	104	1381	260	200	260	200	260	0	0	200	200
									60 C	12/01-03/31	7	17	225									
									60 C	04/01-11/30	17	79	386									
	314								279 C	04/01-10/31	56	1102	866	1102	1102	1102	869	869	0	0	1102	1102
										TOTAL		1302	2858									
2817	315	2618	3140	1838	530	--	60	190	137 C	10/16-04/15	22	179	635	642	642	642	619	619	0	0	642	642
									137 C	04/15-10/15	56	463	364									
										TOTAL		642	999									
2818	316	3523	1467	2683	260	--	--	580	112 C	11/01-05/14	40	291	437	861	773	861	255	343	0	0	773	773
									112 C	05/15-10/31	78	482	136									
										TOTAL		773	829									
2819	317	3407	4290	2827	380	--	--	200	162 C	04/15-09/14	100	812	--	871	812	871	812	871	0	0	812	812
2822	320	1421	1241	1051	170	--	40	160	70 C	05/01-10/11	100	377	--	411	377	411	360	395	0	0	377	377
2823	576	3500	4340	2620	80	170	--	630	216 C	04/15-05/31	48	156	168	874	750	874	669	793	0	0	750	750
									216 C	08/01-11/30	48	416	448									
									60 Y	08/01-10/31	48	65	70									
									9 C	06/01-07/31	48	9	9									
									18 C	03/01-02/28	48	104	112									
										TOTAL		750	807									
2827	325	1811	1280	1151	480	--	40	140	7 C	03/01-02/28	100	86	--	502	448	502	408	462	0	0	448	448
									29 C	05/01-11/30	55	111	91									
									200 S	04/01-07/10	100	131	--									
									15 C	04/01-11/03	100	120	--									
										TOTAL		448	91									
2848	344	2201	981	2121	80	--	--	--	89 C	12/16-04/30	36	144	256	492	492	492	475	475	0	0	492	492
									89 C	05/01-10/31	65	348	187									
										TOTAL		492	443									
2851	347	2240	3313	2240	--	--	--	--	11 C	03/01-02/28	100	134	--	586	586	586	574	574	0	0	586	586
									120 C	05/01-10/09	71	452	185									
										TOTAL		586	185									
2911	401	7756	32802	6235	1442	79	--	--	93 C	03/01-02/28	100	1115	--	1261	1115	1261	908	1054	0	0	1115	1115
2932	422	1241	2479	1241	--	--	--	--	5 C	03/01-02/28	100	57	--	293	293	293	238	238	0	0	293	293
									46 C	05/01-10/15	93	236	18									
										TOTAL		293	18									
2941	431	1356	6574	1224	132	--	--	--	15 C	03/01-02/28	100	177	--	189	177	189	117	129	0	0	177	177
2957	447	1861	7020	1419	442	--	--	--	26 C	03/01-02/28	100	312	--	352	312	352	292	332	0	0	312	312

PROPOSED AMPS (cont.)

RECORD NUMBER	ALLOT NUMBER	PUBLIC ACRES	OTHER ACRES	PUBLIC LAND RANGE CONDITION E+G	FAIR	POOR	UNKNOWN	TP	# & CLS		SEASON	% PUBLIC	CURRENT USE PUBLIC AUMS	CURRENT USE OTHER AUMS	POTENTIAL AUMS	PUBLIC ALTN. A ST	PUBLIC ALTN. A LT	PUBLIC ALTN. B ST	PUBLIC ALTN. B LT	PUBLIC ALTN. C ST	PUBLIC ALTN. C LT	PUBLIC ALTN. D ST	PUBLIC ALTN. D LT
2958	448	1616	600	1454	142	20	--	--	35	C	03/01-02/28	100	424	--	441	424	441	337	354	0	0	424	424
2994	484	4591	10040	4591	--	--	--	--	102	C	03/01-02/28	100	1225	--	1225	1225	1225	1201	1201	0	0	1225	1225
2995	485	2004	2004	1701	303	--	--	--	27	C	03/01-02/28	100	320	--	348	320	348	282	310	0	0	320	320
2999	489	1945	4000	1597	348	--	--	--	29	C	03/01-02/28	100	341	--	373	341	373	282	314	0	0	341	341
3004	494	4204	21740	4117	87	--	--	--	100	C	03/01-02/28	100	1202	--	1210	1202	1210	1156	1164	0	0	1202	1202
3005	495	801	2290	801	--	--	--	--	14	C	03/02-02/28	100	165	--	165	165	165	0	0	0	0	165	165
3006	496	750	1800	686	64	--	--	--	16	C	03/01-02/28	100	188	--	193	188	193	168	173	0	0	188	188
3010	500	2670	2080	2670	--	--	--	--	63	C	03/01-02/28	100	752	--	752	752	752	639	639	0	0	752	752
3025	515	683	2000	683	--	--	--	--	15	C	03/01-02/28	100	184	--	184	184	184	143	143	0	0	184	184
3032	522	1308	1680	1233	75	--	--	--	17	C	03/01-02/28	100	202	--	209	202	209	156	163	0	0	202	202
3054	544	1025	3640	1025	--	--	--	--	23	C	03/01-02/28	100	272	--	272	272	272	204	204	0	0	272	272
3056	546	6829	20922	6829	--	--	--	--	144	C	03/01-02/28	100	1726	--	1726	1726	1726	533	533	0	0	1726	1726
3058	548	3957	7560	3894	63	--	--	--	66	C	03/01-02/28	100	792	--	792	792	792	589	589	0	0	792	792
3059	549	1280	1040	1268	12	--	--	--	21	C	03/01-02/28	100	248	--	249	248	249	213	214	0	0	248	248
6374	847	6233	3410	5293	290	--	--	650	6	C	03/01-02/28	100	74	--	1124	1056	1124	451	525	0	0	1056	1056
									208	C	04/01-11/30	59	982	--									
											TOTAL		1056	682									
6376	849	3571	1181	3571	--	--	--	--	3	C	03/01-02/28	100	32	682	602	602	602	342	342	0	0	602	602
									95	C	04/16-06/15	75	143	47									
									95	C	07/16-01/15	75	427	143									
											TOTAL		602	190									

YEARLONG AND SEASON AND NUMBER ALLOTMENTS

RECORD NUMBER	ALLOT NUMBER	PUBLIC ACRES	OTHER ACRES	E+G	FAIR	POOR	UNKNOWN	TP	# & CLS		SEASON	% PUBLIC	PUBLIC AUMS	OTHER AUMS	POTENTIAL AUMS	ALTN. A ST	ALTN. A LT	ALTN. B ST	ALTN. B LT	ALTN. C ST	ALTN. C LT	ALTN. D ST	ALTN. D LT
2000	1	4406	8216	4406	--	--	--	--	62	C	03/01-02/28	100	743	--	743	743	743	743	743	0	0	743	743
2001	2	40	1600	40	--	--	--	--	1	C	03/01-02/28	100	12	--	12	12	12	12	12	0	0	12	12
2002	480	80	2760	80	--	--	--	--	2	C	03/01-02/28	100	24	--	24	24	24	24	24	0	0	24	24
2004	5	185	3082	105	80	--	--	--	2	C	03/01-02/28	100	20	--	27	20	27	19	26	0	0	20	20
2005	6	76	616	--	76	--	--	--	2	C	03/01-02/28	100	24	--	30	24	30	22	28	0	0	24	24
2006	7	40	880	--	40	--	--	--	1	C	03/01-02/28	100	8	--	8	8	8	8	8	0	0	8	8
2007	8	160	800	85	75	--	--	--	3	C	03/01-02/28	100	36	--	43	36	43	27	34	0	0	36	36
2008	10	53	486	--	53	--	--	--	15	S	03/01-02/28	100	34	--	38	34	38	34	38	0	0	34	34
2010	12	487	1280	197	275	15	--	--	8	C	03/01-02/28	100	101	--	129	101	129	93	121	0	0	101	101
2011	13	1320	17491	1320	--	--	--	--	29	C	03/01-02/28	100	344	--	349	349	349	112	112	0	0	349	349
									1	C	05/01-09/30	100	5	--									
	433	1320	3120	1320	--	--	--	--	22	C	03/01-02/28	100	267	--	267	267	267	267	267	0	0	267	267
											TOTAL		616	--									
2013	16	160	4160	160	--	--	--	--	7	C	05/01-10/15	100	39	--	39	39	39	0	0	0	0	39	39
2019	22	80	880	40	40	--	--	--	2	C	03/01-02/28	100	20	--	24	20	24	20	24	0	0	20	20
2021	28	662	11158	735	--	--	--	--	14	C	03/01-02/28	100	163	--	163	163	163	160	160	0	0	163	163
	29	73	525	--	--	--	--	--	2	C	03/01-02/28	100	18	--	18	18	18	18	18	0	0	18	18
2027	37	120	1160	120	--	--	--	--	2	C	03/01-02/28	100	24	--	24	24	24	24	24	0	0	24	24
2028	38	1905	7646	1855	50	--	--	--	43	C	05/01-11/30	100	301	--	305	301	305	253	257	0	0	301	301
2034	44	80	7776	55	--	--	290	--	3	C	04/01-10/30	100	21	--	21	21	21	15	15	0	0	21	21
2035	45	265	720	--	--	--	--	--	5	C	03/01-02/28	100	55	--	55	55	55	0	0	0	0	55	55
2036	46	715	2280	715	--	--	--	--	10	C	03/01-02/28	100	124	--	124	124	124	0	0	0	0	124	124
2039	50	40	2640	40	--	--	--	--	1	C	03/01-02/28	100	12	--	12	12	12	9	9	0	0	12	12
2040	51	120	960	120	--	--	--	--	3	C	03/01-02/28	100	36	--	36	36	36	36	36	0	0	36	36
2041	52	2624	8689	1984	40	--	600	--	40	C	03/01-02/28	100	478	--	478	478	478	390	390	0	0	478	478
2042	53	1202	19810	1022	--	--	--	180	24	C	03/01-02/18	100	283	--	335	283	335	274	274	0	0	283	283
2043	54	80	2160	80	--	--	--	--	2	C	03/01-02/28	100	18	--	18	18	18	13	13	0	0	18	18
2044	55	584	6880	529	55	--	--	--	11	C	03/01-02/28	100	128	--	133	128	133	110	115	0	0	128	128
2045	56	140	1520	140	--	--	--	--	2	C	03/01-02/28	100	28	--	28	28	28	28	28	0	0	28	28
2047	58	480	3000	480	--	--	--	--	6	C	03/01-02/28	100	74	--	74	74	74	74	74	0	0	74	74
2048	59	12055	96381	11675	380	--	--	--	500	S	03/01-02/28	100	1200	--	2170	2170	2170	820	820	0	0	2170	2170
									73	C	03/01-12/31	100	730	--									
									20	H	03/01-02/28	100	240	--									
											TOTAL		2170	--									
2051	62	640	5120	640	--	--	--	--	10	C	03/01-02/28	100	121	--	121	121	121	96	96	0	0	121	121
2053	64	1127	4173	487	--	--	640	--	3	C	03/01-02/28	100	40	--	210	210	210	208	208	0	0	210	210
									103	C	05/16-09/15	41	170	245									
											TOTAL		210	245									
2059	71	400	3640	400	--	--	--	--	22	C	05/01-09/30	100	110	--	110	110	110	14	14	0	0	110	110
2061	75	547	3730	547	--	--	--	--	9	C	05/01-12/28	100	93	--	93	93	93	93	93	0	0	93	93
2062	76	46	1311	46	--	--	--	--	1	C	03/01-09/30	100	7	--	7	7	7	7	7	0	0	7	7
2063	77	1751	5808	1751	--	--	--	--	12	C	03/01-02/28	100	148	--	148	148	148	63	63	0	0	148	148
2065	78	200	2280	160	40	--	--	--	4	C	03/01-02/28	100	43	--	47	43	47	36	40	0	0	43	43
2066	79	605	4540	447	158	--	--	--	9	C	03/01-02/28	100	114	--	128	114	128	105	119	0	0	114	114
2070	83	135	1005	135	--	--	--	--	1	C	03/01-02/28	100	12	--	12	12	12	12	12	0	0	12	12
2072	86	40	2520	--	40	--	--	--	1	C	03/01-02/28	100	12	--	16	12	16	9	13	0	0	12	12
2073	87	962	16057	962	--	--	--	--	21	C	03/01-02/28	100	257	--	257	257	257	0	0	0	0	257	257
2075	89	2152	27676	2152	--	--	--	--	336	S	05/15-10/15	100	336	--	406	406	406	352	352	0	0	406	406
									14	C	05/15-10/15	100	70	--									
											TOTAL		406	--									
2077	91	320	8373	320	--	--	--	--	3	C	03/01-12/24	100	32	--	32	32	32	25	25	0	0	32	32

YEARLONG AND SEASON AND NUMBER ALLOTMENTS (cont.)

RECORD NUMBER	ALLOT NUMBER	PUBLIC ACRES	OTHER ACRES	PUBLIC LAND RANGE CONDITION E+G	FAIR	POOR	UNKNOWN	TP	# & CLS		SEASON	% PUBLIC	CURRENT USE PUBLIC AUMS	CURRENT USE OTHER AUMS	POTENTIAL AUMS	PUBLIC ALTN. A ST	ALTN. A LT	ALTN. B ST	ALTN. B LT	ALTN. C ST	ALTN. C LT	ALTN. D ST	ALTN. D LT
2080	94	2097	14637	2097	--	--	--	--	32	C	03/01-02/28	100	384	--	384	384	384	367	367	0	0	384	384
2083	99	60	580	60	--	--	--	--	1	C	03/01-02/28	100	12	--	12	12	12	12	12	0	0	12	12
2086	103	40	720	40	--	--	--	--	1	C	03/01-11/30	100	9	--	9	9	9	9	9	0	0	9	9
2087	104	1240	16475	1240	--	--	--	--	15	C	03/01-02/28	100	180	--	180	180	180	180	180	0	0	180	180
2088	105	2240	19469	2240	--	--	--	--	18	C	03/01-02/28	100	216	--	216	216	216	216	216	0	0	216	216
2089	106	184	5237	184	--	--	--	--	5	C	03/01-02/28	100	64	--	64	64	64	64	64	0	0	64	64
2090	107	320	9627	320	--	--	--	--	2	C	03/01-02/28	100	25	--	25	25	25	25	25	0	0	25	25
2096	114	160	1400	160	--	--	--	--	2	C	03/01-02/28	100	24	--	24	24	24	24	24	0	0	24	24
2097	115	40	13720	40	--	--	--	--	1	C	03/01-02/28	100	11	--	11	11	11	11	11	0	0	11	11
2103	124	920	2851	920	--	--	--	--	20	C	03/01-02/28	100	241		241	241	241	241	241	0	0	241	241
2109	130	80	1480	80	--	--	--	--	1	C	03/01-02/28	100	14		14	14	14	14	14	0	0	14	14
2113	134	3840	12431	3180	660	--	--	--	350	Y	05/01-10/14	21	404	1521	738	679	738	679	738	0	0	679	679
									200	Y	05/15-09/30	21	189	486									
									60	Y	10/01-11/30	21	25	65									
									30	Y	10/01-11/30	100	61										
											TOTAL		679	2072									
2114	135	640	23413	640	--	--	--	--	9	C	03/01-02/28	100	108	--	108	108	108	108	108	0	0	108	108
2115	136	1301	28601	1301	--	--	--	--	105	S	03/01-02/28	100	253	--	253	253	253	199	199	0	0	253	253
2117	140	1429	24436	1369	60	--	--	--	120	S	03/01-02/28	100	288	--	296	288	296	206	214	0	0	288	291
2119	143	183	3109	183	--	--	--	--	5	C	03/01-02/28	100	64	--	64	64	64	64	64	0	0	64	64
2120	144	355	4744	355	--	--	--	--	7	C	03/01-02/28	100	84	--	84	84	84	84	84	0	0	84	84
2121	145	600	2860	500	100	--	--	--	11	C	03/01-02/28	100	132	--	141	132	141	123	132	0	0	132	132
2122	146	199	1800	199	--	--	--	--	3	C	03/01-02/28	100	38	--	38	38	38	38	38	0	0	38	38
2123	147	120	10520	120	--	--	--	--	3	C	03/01-12/31	100	33	--	33	33	33	33	33	0	0	33	33
2126	150	1432	4160	762	670	--	--	--	20	C	03/01-02/28	100	236	--	271	236	271	220	255	0	0	236	236
2127	151	916	7640	916	--	--	--	--	12	C	03/01-02/28	100	140	--	140	140	140	114	114	0	0	140	140
2128	152	160	4757	150	10	--	--	--	3	C	03/01-02/28	100	33	--	33	33	33	33	33	0	0	33	33
2132	157	352	4560	352	--	--	--	--	7	C	03/01-02/28	100	81	--	81	81	81	72	72	0	0	81	81
2136	160	40	480	40	--	--	--	--	2	C	05/01-09/30	100	11	--	11	11	11	11	11	0	0	11	11
2137	161	243	1084	83	160	--	--	--	4	C	03/01-11/30	100	32	--	46	32	46	28	42	0	0	32	32
2138	162	160	320	160	--	--	--	--	3	C	03/01-08/31	100	19	--	19	19	19	16	16	0	0	19	19
2140	164	5683	19200	5683	--	--	--	--	109	C	03/01-02/28	100	1311	--	1311	1311	1311	1219	1219	0	0	1311	1311
2141	165	400	1260	400	--	--	--	--	9	C	03/01-02/28	100	111	--	111	111	111	92	92	0	0	111	111
2142	166	245	3520	205	--	--	--	40	7	C	03/01-02/28	100	84	--	89	84	89	84	89	0	0	84	84
2143	167	320	13550	320	--	--	--	--	3	C	03/01-02/28	100	41	--	51	51	51	51	51	0	0	51	51
2145	172	1811	40000	2824	20	--	--	--	35	C	03/01-02/28	100	414	--	414	414	414	306	306	0	0	414	414
	173	1033	--	--	IN	2145	172	--	21	C	03/01-02/28	100	253	--	255	253	255	253	255	0	0	253	253
											TOTAL		667	-									
2147	175	40	1993	40	--	--	--	--	1	C	03/01-02/28	100	11	--	11	11	11	11	11	0	0	11	11
2148	176	497	6240	497	--	--	--	--	9	C	03/02-02/28	100	104	--	104	104	104	97	97	0	0	104	104
2149	177	40	4920	40	--	--	--	--	1	C	03/01-02/28	100	11	--	11	11	11	0	0	0	0	11	11
2151	182	276	6400	276	--	--	--	--	4	C	03/01-02/28	100	48	--	48	48	48	48	48	0	0	48	48
2155	185	79	88475	79	--	--	--	--	2	C	03/01-02/28	100	27	--	27	27	27	27	27	0	0	27	27
2156	186	1759	12552	1459	300	--	--	--	27	C	03/01-02/28	100	328	--	355	328	355	328	355	0	0	328	328
2158	189	80	7950	80	--	--	--	--	2	C	03/01-02/28	100	23	--	23	23	23	21	21	0	0	23	23
2159	190	440	1984	260	180	--	--	--	8	C	03/01-10/31	100	64	--	80	64	80	46	62	0	0	64	64
2160	191	283	1920	237	46	--	--	--	6	C	04/01-11/30	100	46	--	55	46	55	29	38	0	0	46	46
2161	192	360	2240	360	--	--	--	--	6	C	03/01-01/31	100	66	--	66	66	66	64	64	0	0	66	66
2162	193	360	2160	360	--	--	--	--	5	C	03/01-02/28	100	60	--	60	60	60	51	51	0	0	60	60
2163	194	40	1880	40	--	--	--	--	1	C	03/01-09/30	100	7	--	7	7	7	7	7	0	0	7	7
2164	195	960	4160	960	--	--	--	--	14	C	03/01-02/28	100	169	--	169	169	169	158	158	0	0	169	169
2167	199	5362	23389	5282	80	--	--	--	295	S	03/01-02/28	100	710	--	715	710	715	710	715	0	0	710	710

YEARLONG AND SEASON AND NUMBER ALLOTMENTS (cont.)

RECORD NUMBER	ALLOT NUMBER	PUBLIC ACRES	OTHER ACRES	E+G	FAIR	POOR	UNKNOWN	TP	PUBLIC LAND RANGE CONDITION # & CLS	SEASON	% PUBLIC	CURRENT USE PUBLIC AUMS	CURRENT USE OTHER AUMS	POTENTIAL AUMS	PUBLIC ALTN. A ST	PUBLIC ALTN. A LT	PUBLIC ALTN. B ST	PUBLIC ALTN. B LT	PUBLIC ALTN. C ST	PUBLIC ALTN. C LT	PUBLIC ALTN. D ST	PUBLIC ALTN. D LT
2168	200	367	10905	327	--	--	40	--	6 C	03/01-02/28	100	72	--	74	74	74	74	74	0	0	74	74
									10 S	03/01-04/30	100	2	--									
										TOTAL		74	--									
2169	201	2675	7775	2675	--	--	--	--	71 C	05/01-11/30	100	495	--	495	495	495	495	495	0	0	495	495
2170	202	800	4520	800	--	--	--	--	17 C	03/01-02/28	100	200	--	200	200	200	200	200	0	0	200	200
2171	203	1063	6577	423	--	--	640	--	15 C	03/01-02/28	100	187	--	187	187	187	187	187	0	0	187	187
2172	204	4150	18085	4150	--	--	--	--	48 C	03/01-03/31	100	45	--	780	780	780	780	780	0	0	780	780
									38 C	09/04-02/28	100	227	-									
									350 C	04/01-05/23	27	168	96									
									350 C	05/24-07/03	57	264	203									
									350 C	07/04-09/03	11	76	624									
										TOTAL		780	923									
2173	205	1178	1605	1138	--	--	40	--	23 C	03/01-02/28	100	273	--	273	273	273	82	82	0	0	273	273
2174	206	160	880	160	--	--	--	--	3 C	03/01-02/28	100	31	--	31	31	31	27	27	0	0	31	31
2176	209	320	364	320	--	--	--	--	30 C	04/01-10/31	43	91	121	91	91	91	71	71	0	0	91	91
2177	210	30	155	30	--	--	--	--	3 C	07/01-07/31	100	3	--	3	3	3	3	3	0	0	3	3
2179	212	6672	14386	6552	120	--	--	--	94 C	03/01-02/28	100	1133	--	1144	1133	1144	963	974	0	0	1133	1133
2180	213	528	24396	378	150	--	--	--	10 C	03/01-02/28	100	118	--	154	118	154	107	143	0	0	118	118
2181	214	79	477	79	--	--	--	--	2 C	03/01-09/30	100	14	--	14	14	14	14	14	0	0	14	14
2182	215	634	13520	314	--	--	320	--	47 C	06/01-08/31	100	141	--	141	141	141	101	101	0	0	141	141
2183	216	4694	27824	4234	360	--	--	100	590 S	03/01-02/28	100	1420	--	1452	1420	1452	1376	1408	0	0	1420	1420
2184	217	1164	8966	1478	--	--	--	--	21 C	03/01-02/28	100	252	--	252	252	252	227	227	0	0	252	252
	218	314	1268						112 C	08/01-10/31	18	61	278	61	61	61	61	61	0	0	61	61
										TOTAL		313	278									
2185	219	360	3686	320	40	--	--	--	3 C	03/01-02/28	100	36	--	40	36	40	31	35	0	0	36	36
2187	222	1227	11592	1227	--	--	--	--	15 C	03/01-02/28	100	180	--	180	180	180	180	180	0	0	180	180
2188	223	1592	29789	1592	--	--	--	--	28 C	03/01-02/28	100	334	--	334	334	334	334	334	0	0	334	334
2189	224	40	529	40	--	--	--	--	1 C	03/01-02/28	100	9	--	9	9	9	7	7	0	0	9	9
2190	225	320	7093	320	--	--	--	--	7 C	03/01-02/28	100	89	--	89	89	89	89	89	0	0	89	89
2191	226	200	880	200	--	--	--	--	3 C	03/01-02/28	100	38	--	38	38	38	34	34	0	0	38	38
2192	227	120	3600	80	40	--	--	--	2 C	03/01-02/28	100	29	--	33	29	33	23	27	0	0	29	29
2193	228	971	14417	931	20	20	--	--	115 S	03/01-02/28	100	276	--	313	276	313	276	313	0	0	276	276
2194	229	490	4151	460	30	--	--	--	4 C	03/01-02/28	100	52	--	54	52	54	45	47	0	0	52	52
2195	230	634	8690	634	--	--	--	--	16 C	03/01-02/28	100	197	--	197	197	197	175	175	0	0	197	197
2196	231	80	1640	80	--	--	--	--	2 C	03/01-02/28	100	18	--	18	18	18	16	16	0	0	18	18
2197	232	915	3040	875	40	--	--	--	11 C	03/01-02/28	100	132	--	136	132	136	121	125	0	0	132	132
2200	237	160	1666	160	--	--	--	--	20 S	03/01-02/28	100	46	--	46	46	46	46	46	0	0	46	46
2201	238	1489	6131	569	920	--	--	--	18 C	03/01-02/28	100	215	--	279	215	279	178	242	0	0	215	215
2202	239	600	15441	600	--	--	--	--	55 S	03/01-02/28	100	136	--	136	136	136	80	80	0	0	136	136
2203	470	360	6566	300	--	--	60	--	15 C	03/01-08/31	100	91	--	91	91	91	91	91	0	0	91	91
2204	107	320	127040	2569	310	--	310	--	10 S	03/01-02/28	100	25	--	406	404	406	381	383	0	0	404	404
	241	2869							160 S	03/01-02/28	100	379	--									
										TOTAL		404	--									
2206	243	3251	7160	2631	140	--	--	480	75 C	03/01-02/28	100	895	--	962	895	962	895	962	0	0	895	895
2208	245	80	1760	80	--	--	--	--	2 C	03/01-02/28	100	22	--	22	22	22	22	22	0	0	22	22
2209	246	38	435	38	--	--	--	--	1 C	03/01-02/28	100	12	--	12	12	12	6	6	0	0	12	12
2210	247	480	3590	480	--	--	--	--	9 C	03/01-02/28	100	104	--	104	104	104	47	47	0	0	104	104
2218	257	240	2875	240	--	--	--	--	55 S	05/01-11/07	100	69	--	69	69	69	69	69	0	0	69	69
2221	260	480	2860	160	--	--	320	--	8 C	03/01-02/28	100	96	--	96	96	96	90	90	0	0	96	96
2222	261	1760	12841	1760	--	--	--	--	21 C	03/01-02/28	100	252	--	252	252	252	252	252	0	0	252	252

YEARLONG AND SEASON AND NUMBER ALLOTMENTS (cont.)

RECORD NUMBER	ALLOT NUMBER	PUBLIC ACRES	OTHER ACRES	PUBLIC LAND RANGE CONDITION E+G	FAIR	POOR	UNKNOWN	TP	# & CLS		SEASON	% PUBLIC	CURRENT USE PUBLIC AUMS	CURRENT USE OTHER AUMS	POTENTIAL AUMS	PUBLIC ALTN. A ST	ALTN. A LT	ALTN. B ST	ALTN. B LT	ALTN. C ST	ALTN. C LT	ALTN. D ST	ALTN. D LT
2226	265	1785	8060	1705	80	--	--	--	20	C	03/01-02/28	100	240	--	353	346	353	303	310	0	0	346	346
									45	S	03/01-02/28	100	106	--									
											TOTAL		346	--									
2228	267	1440	21409	1390	50	--	--	--	109	S	03/01-02/28	100	260	--	355	350	355	1	6	0	0	350	350
									9	C	03/01-12/31	100	90	--									
											TOTAL		350	--									
2230	270	400	15672	370	30	--	--	--	7	C	03/01-02/28	100	84	--	86	84	86	23	25	0	0	84	84
2231	271	160	10400	160	--	--	--	--	30	S	03/01-04/30	100	12	--	47	47	47	41	41	0	0	47	47
									30	S	09/01-02/28	100	35	--									
											TOTAL		47	--									
2233	273	957	10236	747	210	--	--	--	17	C	03/01-12/31	100	170	--	188	170	188	0	0	0	0	170	170
2234	274	2240	31475	2240	--	--	--	--	21	C	03/01-02/28	100	259	--	306	259	306	224	271	0	0	259	259
2235	275	40	2071	40	--	--	--	--	1	C	03/01-12/31	100	10	--	10	10	10	10	10	0	0	10	10
2237	278	1083	4167	1083	--	--	--	--	103	S	03/01-02/28	100	247	--	271	271	271	262	262	0	0	271	271
									2	C	03/01-02/28	100	24	--									
											TOTAL		271	--									
2240	281	640	59065	3247	230	--	--	--	14	C	03/01-02/28	100	169	--	169	169	169	164	164	0	0	169	169
2241	282	2837			IN	2240	281		65	C	03/01-02/28	100	778	--	778	778	778	0	0	0	0	778	778
											TOTAL		947	--									
2248	288	160	3930	140	20	--	--	--	25	S	03/01-10/31	100	39	--	41	39	41	0	0	0	0	39	39
2249	289	1988	7300	1798	190	--	--	--	43	C	03/01-02/28	14	72	442	495	480	495	475	490	0	0	480	480
									1190	S	03/01-02/28	14	400	2457									
									5	H	03/01-02/28	14	8	49									
											TOTAL		480	2948									
2251	292	1938	17216	1908	30	--	--	--	24	C	03/01-02/28	100	288	--	290	288	290	288	290	0	0	288	288
2252	293	2915	6779	625	--	--	2290	--	49	C	03/01-12/31	100	489	--	489	489	489	489	489	0	0	489	489
2258	299	160	5149	160	--	--	--	--	4	C	03/01-12/31	100	40	--	40	40	40	40	40	0	0	40	40
2259	300	2864	20560	2734	130	--	--	--	37	C	04/01-11/30	100	297	--	307	297	307	297	307	0	0	297	297
2262	304	360	9044	320	--	--	40	--	14	C	06/01-08/31	100	42	--	42	42	42	4	4	0	0	42	42
2268	308	160	3606	160	--	--	--	--	4	C	03/01-12/81	100	40	--	40	40	40	40	40	0	0	40	40
2269	309	660	3621	660	--	--	--	--	10	C	03/01-02/28	100	121	--	121	121	121	119	119	0	0	121	121
2271	311	40	230	--	--	--	40	--	1	C	03/01-12/31	100	10	--	10	10	10	10	10	0	0	10	10
2272	312	715	13230	715	--	--	--	--	20	C	04/01-11/30	100	160	--	160	160	160	131	131	0	0	160	160
2275	315	120	7880	120	--	--	--	--	3	C	03/01-02/28	100	33	--	33	33	33	33	33	0	0	33	33
2276	316	200	2197	200	--	--	--	--	4	C	03/01-02/28	100	48	--	48	48	48	48	48	0	0	48	48
2277	317	80	6550	80	--	--	--	--	2	C	03/01-02/28	100	18	--	18	18	18	18	18	0	0	18	18
2287	324	40	3040	40	--	--	--	--	5	S	03/01-02/28	100	12	--	12	12	12	9	9	0	0	12	12
2288	325	320	4467	280	40	--	--	--	15	C	05/01-10/31	100	91	--	95	91	95	89	93	0	0	91	91
2289	326	26	2566	26	--	--	--	--	1	C	03/01-02/28	100	12	--	12	12	12	12	12	0	0	12	12
2290	327	800	5432	800	--	--	--	--	2	C	03/01-02/28	100	21	--	192	192	192	21	21	0	0	192	192
									29	C	09/01-02/28	100	171	--									
											TOTAL		192	--									
2291	328	1941	12084	1601	340	--	--	--	436	C	05/01-11/30	7	244	3242	262	244	262	244	262	0	0	244	244
2293	330	480	4040	480	--	--	--	--	10	C	03/01-02/28	100	114	--	114	114	114	111	111	0	0	114	114
2294	331	40	1572	--	40	--	--	--	1	C	04/01-11/30	100	8	--	12	8	12	5	9	0	0	8	8
2295	332	108	900	108	--	--	--	--	2	C	03/01-02/28	100	24	--	24	24	24	18	18	0	0	24	24
2296	333	4765	25603	4765	--	--	--	--	40	C	03/01-02/28	100	486	--	486	486	486	282	282	0	0	486	486
2297	334	400	640	400	--	--	--	--	10	C	03/01-02/28	100	115	--	115	115	115	115	115	0	0	115	115
2298	335	40	1052	40	--	--	--	--	1	C	04/01-11/30	100	8	--	8	8	8	6	6	0	0	8	8
2299	336	80	729	80	--	--	--	--	2	C	03/01-02/28	100	23	--	23	23	23	19	19	0	0	23	23

YEARLONG AND SEASON AND NUMBER ALLOTMENTS (cont.)

RECORD NUMBER	ALLOT NUMBER	PUBLIC ACRES	OTHER ACRES	E+G	FAIR	POOR	UNKNOWN	PUBLIC LAND RANGE CONDITION TP	# & CLS	SEASON	% PUBLIC	CURRENT USE PUBLIC AUMS	CURRENT USE OTHER AUMS	POTENTIAL AUMS	PUBLIC ALTN. A ST	ALTN. A LT	ALTN. B ST	ALTN. B LT	ALTN. C ST	ALTN. C LT	ALTN. D ST	ALTN. D LT
2300	337	640	4244	500	140	--	--	--	5 C	03/01-02/28	100	60	--	73	60	73	60	73	0	0	60	60
2301	338	440	3680	1388	--	--	--	--	7 C	03/01-02/28	100	90	--	90	90	90	90	90	0	0	90	90
	339	640	5426	--	--	--	--	--	14 C	03/01-02/28	100	171	--	171	171	171	171	171	0	0	171	171
	340	308	2851	--	--	--	--	--	5 C	03/01-02/28	100	63	--	63	63	63	63	63	0	0	63	63
										TOTAL		324	--		1712						1712	1712
2303	342	6244	54451	9598	1870	--	--	--	81 C	03/01-02/28	100	975	--	1880	975	1880	651	819	0	0	975	975
	343	5224	37200						61 C	03/01-02/28	100	737	--									
										TOTAL		1712										
2304	123	3840	14399	3840	--	--	--	--	43 C	03/01-02-28	100	520	--	520	520	520	517	517	0	0	520	520
2307	346	535	1980	135	400	--	--	--	4 C	03/01-02/28	100	48	--	84	48	84	41	77	0	0	48	48
2308	347	960	24883	560	400	--	--	--	18 C	03/01-02/28	100	218	--	244	218	244	218	244	0	0	218	218
2309	348	320	1020	320	--	--	--	--	5 C	03/01-02/28	100	54	--	54	54	54	44	44	0	0	54	54
2310	349	120	903	105	15	--	--	--	2 C	03/01-02/28	100	24	--	26	24	24	26	26	0	0	24	24
2313	354	80	1885	20	60	--	--	--	1 C	03/01-02/28	100	13	--	18	13	18	13	18	0	0	13	13
2314	355	2760	51304	1760	320	--	680	--	46 C	03/01-02/28	100	552	--	577	552	577	165	190	0	0	552	552
2315	356	1040	9833	1040	--	--	--	--	21 C	03/01-02/28	100	252	--	252	252	252	252	252	0	0	252	252
2317	358	320	1401	200	120	--	--	--	6 C	03/01-02/28	100	67	--	78	67	78	67	78	0	0	67	67
2320	361	80	320	80	--	--	--	--	2 C	03/01-02/28	100	22	--	22	22	22	22	22	0	0	22	22
2321	362	2351	16180	2351	--	--	--	--	24 C	03/01-02/28	100	286	--	286	286	286	218	218	0	0	286	286
2322	363	160	2917	160	--	--	--	--	20 S	03/01-02/28	100	47	--	47	47	47	47	47	0	0	47	47
2323	364	320	1908	320	--	--	--	--	5 C	03/01-02/28	100	59	--	59	59	59	52	52	0	0	59	59
2324	365	320	9777	320	--	--	--	--	5 C	03/01-02/28	100	60	--	60	60	60	60	60	0	0	60	60
2326	367	40	3640	20	20	--	--	--	1 C	03/01-02/28	100	12	--	14	12	14	12	14	0	0	12	12
2327	368	440	4040	440	--	--	--	--	11 C	03/01-02/28	100	132	--	132	132	132	0	0	0	0	132	132
2328	369	4933	22672	4843	90	--	--	--	18 C	03/01-02/28	100	212	2528	892	884	892	884	892	0	0	884	884
									400 C	04/01-11/30	21	672										
										TOTAL		884	2528									
2329	370	920	47480	920	--	--	--	--	22 C	03/01-02/28	100	260	--	260	260	260	215	215	0	0	260	260
2330	371	1226	16673	861	365	--	--	--	20 C	03/01-02/28	100	238	--	272	238	272	58	92	0	0	238	238
2340	383	200	224	95	105	--	--	--	1 C	03/01-02/28	100	19	--	28	19	28	17	26	0	0	19	19
2341	384	1520	2560	740	--	--	780	--	1 C	03/01-02/28	100	8	--	328	328	328	207	207	0	0	328	328
									90 C	05/01-09/30	71	320	131									
										TOTAL		328	131									
2344	387	436	4295	436	--	--	--	--	7 C	03/01-02/28	100	84	--	84	84	84	76	76	0	0	84	84
2346	481	240	1840	240	--	--	--	--	4 C	03/01-02/28	100	48	--	48	48	48	42	42	0	0	48	48
2348	393	1124	10268	1054	—	--	70	--	27 C	03/01-02/28	100	324	--	324	324	324	324	324	0	0	324	324
2349	394	320	400	320	--	--	--	--	4 C	03/01-02/28	100	43	--	43	43	43	43	43	0	0	43	43
2350	395	1470	4988	970	500	--	--	--	19 C	03/01-02/28	100	227	--	262	227	262	189	224	0	0	227	227
2352	397	638	880	638	--	--	--	--	11 C	03/01-02/28	100	129	--	129	129	129	120	120	0	0	129	129
2353	398	519	3100	469	50	--	--	--	9 C	03/01-02/28	100	104	--	108	104	108	100	104	0	0	104	104
2357	479	632	5135	632	--	--	--	--	14 C	03/01-02/28	100	168	--	168	168	168	168	168	0	0	168	168
2358	407	960	7880	960	--	--	--	--	15 C	03/01-02/28	100	183	--	183	183	183	183	183	0	0	183	183
2361	410	160	6611	110	50	--	--	--	2 C	03/01-02/28	100	24	--	28	24	28	24	28	0	0	24	24
2363	411	554	10126	74	480	--	--	--	9 C	03/01-02/28	100	108	--	151	108	151	0	38	0	0	108	108
2364	412	40	3718	40	--	--	--	--	1 C	03/01-02/28	100	9	--	9	9	9	9	9	0	0	9	9
2365	413	73	315	73	--	--	--	--	3 C	03/01-02/28	100	36	--	36	36	36	36	36	0	0	36	36
2366	414	40	8173	--	--	40	--	--	2 C	05/01-10/31	100	11	--	15	11	15	9	13	0	0	11	11
2367	415	1846	6587	1846	--	--	--	--	18 C	03/01-02/28	100	213	--	213	213	213	28	28	0	0	213	213

YEARLONG AND SEASON AND NUMBER ALLOTMENTS (cont.)

RECORD NUMBER	ALLOT NUMBER	PUBLIC ACRES	OTHER ACRES	E+G	FAIR	POOR	UNKNOWN	TP	PUBLIC LAND RANGE CONDITION # & CLS	SEASON	% PUBLIC	CURRENT USE PUBLIC AUMS	CURRENT USE OTHER AUMS	POTENTIAL AUMS	PUBLIC ALTN. A ST	ALTN. A LT	ALTN. B ST	ALTN. B LT	ALTN. C ST	ALTN. C LT	ALTN. D ST	ALTN. D LT
2368	416	840	6722	730	110	--	--	--	18 C	03/01-02-28	100	216	—	225	216	225	210	210	0	0	216	216
2369	117	480	19000	480	--	--	--	--	8 C	03/01-02/28	100	96	--	96	96	96	96	96	0	0	96	96
2370	418	200	1720	100	100	--	--	--	5 C	03/01-02/28	100	57	--	66	57	66	48	57	0	0	57	57
2372	420	440	3356	440	--	--	--	--	7 C	03/01-02/28	100	88	--	88	88	88	85	85	0	0	88	88
2376	424	1589	1907	1589	--	--	--	--	44 C	03/01-02/28	100	534	--	586	534	586	531	583	0	0	534	534
2383	429	1281	13271	961	--	--	320	--	14 C	03/01-02/28	100	173	--	173	173	173	11	11	0	0	173	173
2385	142	7582	22499	6555	1027	--	--	--	146 C	03/01-02/28	100	1748	--	1800	1748	1800	1428	1480	0	0	1748	1748
2386	475	240	1440	240	--	--	--	--	5 C	03/01-02/28	100	57	--	57	57	57	57	57	0	0	57	57
2387	476	40	812	40	--	--	--	--	1 C	03/01-02/28	100	9	--	9	9	9	8	8	0	0	9	9
2388	477	138	1960	138	--	--	--	--	3 C	03/01-02/28	100	34	--	34	34	34	28	28	0	0	34	34
2389	478	320	2400	320	--	--	--	--	7 C	03/01-02/28	100	86	--	86	86	86	82	82	0	0	86	86
2500	1	40	2520	40	--	--	--	--	1 C	03/01-02/28	100	10	--	10	10	10	10	10	0	0	10	10
2501	2	960	3200	960	--	--	--	--	10 C	06/01-11/30	100	60	--	157	60	157	60	157	0	0	60	60
2669*	167	320	3249	320	--	--	--	--	95 C	03/01-02/28	8	92	1048	97	97	97	97	97	0	0	97	97
									54 C	03/01-02/28	8	5	8									
										TOTAL		157	8									
2502	3	160	230	160	--	--	--	--	3 C	03/01-02/28	100	38	--	38	38	38	38	38	0	0	38	38
2503	4	80	1200	40	10	--	--	30	2 C	03/01-02/28	100	24	—	28	24	28	24	28	0	0	24	24
2504	5	200	680	200	--	--	--	--	4 C	03/01-02/28	100	50	--	50	50	50	0	0	0	0	50	50
2505	6	320	3840	280	40	--	--	--	95 C	03/01-02/28	9	103	1041	109	105	109	105	109	0	0	105	105
									1 H	03/01-02/28	9	2	20									
	171	160	2944	160	--	--	--	--	47 C	03/01-02/28	9	51	513	65	52	65	52	65	0	0	52	52
									1 H	03/01-02/28	9	1	11									
										TOTAL		157	1585									
2506	7	520	10357	315	160	--	--	45	8 C	03/01-02/28	100	95	--	113	95	113	53	71	0	0	95	95
2507	8	786	9120	348	240	--	--	198	14 C	03/01-02/28	100	168	--	215	168	215	49	96	0	0	168	168
2508	9	4990	9189	3035	351	--	--	1604	310 C	04/01-02/28	29	989	2421	1540	1309	1540	1117	1348	0	0	1309	1309
									230 Y	04/15-09/15	29	250	612									
									40 Y	04/15-11/15	29	61	149									
									15 C	06/20-08/20	29	9	21									
										TOTAL	116	1309	3203									
2509	10	2480	16339	2020	--	--	--	460	49 C	03/01-02/28	100	587	--	645	587	645	558	616	0	0	587	587
2510	11	40	1920	--	40	--	--	--	1 C	03/01-02/28	100	12	--	16	12	16	12	16	0	0	12	12
2511	12	200	2726	140	40	--	--	20	5 C	03/01-02/28	100	60	--	67	60	67	60	67	0	0	60	60
2512	13	240	2560	--	40	--	—	200	5 C	03/01-02/28	100	60	--	112	60	122	57	109	0	0	60	60
2513	14	3300	7537	3006	294	--	--	--	354 C	05/15-11/01	54	1050	894	1077	1050	1077	1041	1068	0	0	1050	1050
2515	16	620	1600	390	--	--	--	230	18 C	03/01-02/28	100	165	--	165	165	165	164	164	0	0	165	165
2516	17	1563	7191	1416	147	--	--	--	37 C	03/01-02/28	100	442	--	451	442	451	385	404	0	0	442	442
2677	175	720	4347	682	--	--	--	38	160 C	03/01-02/28	11	212	1708	221	216	221	216	221	0	0	216	216
									3 H	03/01-02/28	11	4	32									
										TOTAL		658	1740									
2517	18	2316	8002	1548	768	--	--	--	28 C	03/01-02/28	100	334	--	359	334	359	13	38	0	0	334	334
2518	19	640	2400	422	--	--	--	218	18 C	03/01-02/28	100	164	--	192	164	192	160	188	0	0	164	164

YEARLONG AND SEASON AND NUMBER ALLOTMENTS (cont.)

RECORD NUMBER	ALLOT NUMBER	PUBLIC ACRES	OTHER ACRES	PUBLIC LAND RANGE CONDITION E+G	FAIR	POOR	UNKNOWN	TP	# & CLS		SEASON	% PUBLIC	CURRENT USE PUBLIC AUMS	OTHER AUMS	POTENTIAL AUMS	PUBLIC ALTN. A ST	ALTN. A LT	ALTN. B ST	ALTN. B LT	ALTN. C ST	ALTN. C LT	ALTN. D ST	ALTN. D LT
2519	20	440	8440	146	64	--	--	230	10	C	03/01-02/28	100	120	--	154	120	154	120	154	0	0	120	120
2520	21	320	3400	--	45	--	--	275	8	C	03/01-02/28	100	100	--	139	100	139	100	139	0	0	100	100
2521	22	800	4304	77	237	--	--	486	15	C	03/01-02/28	100	185	--	267	185	267	0	0	0	0	185	185
2522	23	720	1200	720	--	--	--	--	18	C	03/01-02/28	100	185	--	249	185	249	182	246	0	0	185	185
2523	24	80	1120	--	--	--	--	80	2	C	03/01-02/28	100	20	--	20	20	20	20	20	0	0	20	20
2524	25	160	2656	160	--	--	--	--	3	C	03/01-02/28	100	38	--	38	38	38	38	38	0	0	38	38
2525	26	40	1280	40	--	--	--	--	1	C	03/01-02/28	100	5	--	5	5	5	5	5	0	0	5	5
2526	27	1440	4000	435	236	--	51	718	8	C	03/01-02/28	100	96	—	559	447	557	447	559	0	0	447	447
									113	C	05/05-09/04	71	322	130									
									95	C	11/01-11/13	71	29	12									
											TOTAL		447	142									
2527	28	630	1920	164	166	--	--	300	56	C	05/15-08/14	100	168	--	221	168	221	168	221	0	0	168	168
2711*	209	160	1010	160	--	--	--	--	4	C	03/01-02/28	100	43	--	43	43	43	43	43	0	0	43	43
											TOTAL		211										
2528	29	1280	1487	904	--	--	58	318	81	C	03/01-02/28	36	351	621	401	361	401	361	401	0	0	361	361
									2	H	03/01-02/28	36	10	14									
											TOTAL		361	635									
2529	30	600	4120	331	269	--	--	--	13	C	03/01-02/28	100	114	114	114	114	114	114	114	0	0	114	114
2530	31	960	3840	960	--	--	--	--	28	C	09/01-12/31	100	114	--	114	114	114	114	114	0	0	114	114
2531	32	280	5440	130	--	--	--	150	7	C	03/01-02/28	100	87	--	106	87	106	87	106	0	0	87	87
2532	33	1600	3387	960	640	--	--	--	80	C	06/01-09/30	58	186	134	528	470	528	454	512	0	0	470	470
									61	C	04/01-11/30	58	284	204									
											TOTAL		470	338									
2534	35	1280	1440	634	244	--	154	248	27	C	03/01-02/28	100	322	--	375	322	375	309	362	0	0	322	322
2535	36	576	3065	576	--	--	--	--	200	C	06/01-10/15	19	171	729	171	171	171	171	171	0	0	171	171
2536	37	720	4400	410	48	--	--	262	98	C	03/02-02/28	15	176	1000	190	180	190	38	48	0	0	180	180
									2	H	03/01-02/28	15	4	20									
2679*	177	1920	8640	1920	—	--	--	--	259	C	03/01-02/28	15	466	2642	498	470	498	470	498	0	0	470	470
									2	H	03/01-02/28	15	4	20									
											TOTAL		650	3792									
2537	38	320	2245	320	--	--	--	--	6	C	03/01-02/28	100	73	--	73	73	73	0	0	0	0	73	73
2538	39	797	1267	797	--	--	--	--	14	C	03/01-02/28	100	162	--	162	162	162	149	149	0	0	162	162
2540	41	80	955	--	--	--	40	40	1	C	03/01-02/28	100	16	--	21	16	21	16	21	0	0	16	16
2541	42	640	4750	480	160	--	--	--	14	C	03/01-02/28	100	164	--	178	164	178	164	178	0	0	164	164
2542	43	40	1520	--	40	--	--	--	1	C	03/01-02/28	100	12	--	16	12	16	12	12	0	0	12	12
2543	44	1440	3360	1112	40	--	--	288	31	C	03/02-02/28	100	376	--	416	376	416	84	124	0	0	376	376
2544	45	80	2401	80	--	--	--	--	2	C	03/01-02/28	100	22	--	22	22	22	22	22	0	0	22	22
2545	46	1920	6535	1766	77	--	--	77	41	C	03/01-02/28	100	492	--	504	492	504	212	224	0	0	492	492
2546	47	320	1766	--	70	--	--	250	8	C	03/01-02/28	100	96	--	134	96	134	93	131	0	0	96	96
2548	49	403	4784	373	30	--	--	--	7	C	03/01-02/28	100	87	--	89	87	89	78	80	0	0	87	87
2552	53	640	5322	307	301	--	--	32	57	C	03/01-02/28	18	123	560	128	123	128	123	128	0	0	123	123
2689*	187	640	--	640	--	—	--	--	99	C	03/01-02/28	18	214	974	224	214	224	214	224	0	0	214	214
											TOTAL		337	1534									
2553	54	320	6720	320	--	--	--	--	58	C	03/01-02/28	9	63	637	64	64	64	64	64	0	0	64	64
									1	H	03/01-02/28	9	1	10									
2688*	186	960	--	960	--	--	--	--	206	C	03/01-02/28	9	223	2248	225	225	225	225	225	0	0	225	225
									1	H	03/01-02/28	9	2	11									
											TOTAL		289	2906									

YEARLONG AND SEASON AND NUMBER ALLOTMENTS (cont.)

RECORD NUMBER	ALLOT NUMBER	PUBLIC ACRES	OTHER ACRES	PUBLIC LAND RANGE CONDITION E+G	FAIR	POOR	UNKNOWN	TP	# & CLS	SEASON	% PUBLIC	CURRENT USE PUBLIC AUMS	CURRENT USE OTHER AUMS	POTENTIAL AUMS	PUBLIC ALTN. A ST	ALTN. A LT	ALTN. B ST	ALTN. B LT	ALTN. C ST	ALTN. C LT	ALTN. D ST	ALTN. D LT
2554	55	320	3640	320	--	--	--	--	7 C	03/01-02/28	100	84	--	84	84	84	84	84	0	0	84	84
2556	57	320	3520	275	45	--	--	--	3 C	03/01-02/28	100	41	--	42	41	42	36	37	0	0	41	41
2557	58	360	16836	90	--	--	--	270	7 C	03/01-02/28	100	88	--	122	88	122	86	120	0	0	88	88
2796	292	2241	2882	2171	70	--	--	--	38 C	03/01-02/28	100	455	--	459	455	459	431	435	0	0	455	455
										TOTAL		543										
2559	60	222	2640	—	222	--	--	--	6 C	03/01-02/28	100	56	--	76	56	76	56	76	0	0	56	56
2560	61	488	6836	142	26	--	320	--	78 C	03/01-02/28	13	122	816	129	128	129	128	129	0	0	128	128
									3 H	03/01-02/28	13	6	40									
2690	188	142		142	--	--	--	--	21 C	03/01-02/28	13	33	219	34	34	34	34	34	0	0	34	34
									1 H	03/01-02/28	13	1	11									
										TOTAL		162	1086									
2561	62	640	320	640	--	--	--	--	14 C	03/01-02/28	100	174	--	174	174	174	174	174	0	0	174	174
2562	63	440	5035	357	--	--	--	83	8 C	03/01-02/28	100	174	--	174	174	174	174	174	0	0	174	174
2692	190	640	6100	640	--	--	--	--	40 C	05/01-08/15	100	142	--	142	142	142	35	35	0	0	142	142
										TOTAL		316										
2563	64	2237	2880	2045	--	--	--	192	23 C	03/01-02/28	100	273	--	675	651	675	651	675	0	0	651	651
									60 Y	05/01-09/15	100	174										
									40 C	06/15-08/15	100	82										
									130 C	10/20-12/17	10	122	129									
										TOTAL		651	129									
2564	65	200	2160	100	--	--	--	100	5 C	03/01-02/28	100	60	--	73	60	73	60	73	0	0	60	60
2565	66	581	2772	347	--	164	--	70	12 C	03/01-02/28	100	120	--	189	120	189	36	105	0	0	120	120
2566	67	2770	3640	2451	319	--	--	--	339 C	06/15-09/15	34	346	672	375	346	375	344	373	0	0	346	346
2567	68	400	2400	214	--	--	--	186	9 C	03/01-02/28	100	106	--	130	106	130	95	119	0	0	106	106
2570	71	800	10800	723	--	--	--	77	16 C	03/01-02/28	100	194	--	203	194	203	194	203	0	0	194	194
2571	72	1097	2520	713	--	--	--	384	20 C	03/01-02/28	100	243	--	291	243	291	135	183	0	0	243	243
2572	73	318	3443	--	318	--	--	--	8 C	03/01-02/28	100	96	--	124	96	124	95	123	0	0	96	96
2573	74	1920	1120	1504	416	--	--	--	35 C	05/15-09/14	30	42	98	47	42	47	42	47	0	0	42	42
2574	74	—				IN	#2573	74	60 C	05/15-09/14	30	72	168	82	72	82	70	80	0	0	72	72
2575	75	1557	7611	930	224	--	320	83	34 C	03/01-02/28	100	408	--	428	408	428	301	321	0	0	408	408
2577	77	760	4742	760	--	--	--	--	12 C	03/01-02/28	100	145	--	145	145	145	145	145	0	0	145	145
2715*	213	160		160	--	--	--	--	4 C	03/01-02/28	100	42	--	42	42	42	39	39	0	0	42	42
										TOTAL		187										
2578	78	640	6960	640	--	--	--	--	14 C	03/01-02/28	100	164	--	164	164	164	164	164	0	0	164	164
2579	79	320	943	--	40	--	--	280	21 C	05/01-09/15	100	95	--	106	95	106	95	106	0	0	95	95
2580	80	160	3069	77	--	--	--	83	5 C	03/01-02/18	100	55	--	94	55	94	55	94	0	0	55	55
2581	81	1935	3266	1813	39	--	83	--	127 C	06/01-11/01	39	265	414	268	265	268	246	249	0	0	265	265
2582	82	1411	2960	744	667	--	--	--	26 C	03/01-02/28	100	319	--	381	319	381	273	335	0	0	319	319
2583	83	143	3968	--	143	--	--	--	3 C	03/01-02/28	100	37	--	66	37	66	37	66	0	0	37	37
2584	84	320	960	--	230	--	--	90	7 C	03/01-02/28	100	83	--	115	83	115	83	115	0	0	83	83
2585	85	640	1920	497	143	--	--	--	9 C	03/01-02/28	100	110	--	123	110	123	109	122	0	0	110	110
2586	86	440	2592	357	83	--	--	--	6 C	03/01-02/28	100	76	--	84	76	84	71	79	0	0	76	76
2587	87	360	1160	264	96	--	--	--	7 C	03/01-02/28	100	80	--	89	80	89	73	82	0	0	80	80
2588	88	1000	23200	680	--	--	320	--	20 C	03/01-02/28	100	238	--	238	238	238	210	210	0	0	238	238
2589	89	320	1600	186	--	--	--	134	8 C	03/01-02/28	100	97	--	114	97	114	97	114	0	0	97	97
2592	92	1260	3840	1126	--	--	--	134	1 C	03/01-02/28	100	5	--	338	321	338	58	75	0	0	321	321
									300 S	12/01-03/31	66	158	82									
									51 C	05/01-06/15	100	76	--									
									55 C	06/16-07/31	100	82	--									
										TOTAL		321	82									

YEARLONG AND SEASON AND NUMBER ALLOTMENTS (cont.)

RECORD NUMBER	ALLOT NUMBER	PUBLIC ACRES	OTHER ACRES	PUBLIC LAND RANGE CONDITION E+G	FAIR	POOR	UNKNOWN	TP	# & CLS	SEASON	% PUBLIC	CURRENT USE PUBLIC AUMS	CURRENT USE OTHER AUMS	POTENTIAL AUMS	PUBLIC ALTN. A ST	ALTN. A LT	ALTN. B ST	ALTN. B LT	ALTN. C ST	ALTN. C LT	ALTN. D ST	ALTN. D LT
2593	93	40	1520	--	--	--	40	--	1 C	03/01-02/28	100	12	--	12	12	12	12	12	0	0	12	12
2594	94	4053	3972	3797	256	--	--	--	250 C	06/10-09/10	45	345	422	368	345	368	281	304	0	0	345	345
2595	95	3053	12317	1792	314	--	27	920	62 C	03/01-02/28	100	744	--	887	744	887	0	104	0	0	744	744
2596	96	819	5378	602	147	--	--	70	15 C	03/01-02/28	100	180	--	202	180	202	140	162	0	0	180	180
2597	97	729	3385	149	500	--	80	--	15 C	03/01-02/28	100	178	--	223	178	223	178	223	0	0	178	178
2598	98	160	2720	130	30	--	--	--	2 C	03/01-02/28	100	24	--	25	24	25	23	24	0	0	24	24
2599	99	115	1600	25	--	--	77	13	3 C	03/01-02/28	100	38	--	40	38	40	38	40	0	0	38	38
2600	100	120	2400	120	--	--	--	--	3 C	03/01-02/28	100	34	--	34	34	34	34	34	0	0	34	34
2601	101	320	3524	--	300	--	--	20	15 C	05/15-11/17	100	92	--	122	92	122	57	87	0	0	92	92
2602	102	3530	4267	3260	270	--	--	--	20 H	03/01-02/28	37	89	151	986	962	986	943	967	0	0	962	962
									218 C	04/15-11/14	37	564	962									
									120 C	04/15-11/14	100	160	--									
									30 C	06/20-11/18	100	149	--									
										TOTAL		962	1113									
2603	103	320	-	320	--	--	--	90	52 C	03/01-02/28	15	93	527	143	93	143	0	49	0	0	93	93
2604	104	280	2360	--	164	--	26	--	6 C	03/01-02/28	100	72	--	100	72	100	72	100	0	0	72	72
2605	105	235	4877	235	--	--	--	360	6 C	03/01-02/28	100	72	--	72	72	72	72	72	0	0	72	72
2606	106	1800	11121	1400	--	--	40	220	45 C	-3/01-02/28	100	540	--	585	540	585	346	391	0	0	540	540
2607	107	1280	3840	1060	--	--	--	--	26 C	03/01-02/28	100	309	--	337	309	337	298	326	0	0	309	309
2608	108	160	5099	160	--	--	--	--	3 C	03/01-02/18	100	39	--	39	39	39	39	39	0	0	39	39
2609	74	--	960			In #	2573-74		73 C	05/15-09/14	30	88	205	99	88	99	88	99	0	0	88	88
2610	74	--	960			In #	2573-74	518	73 C	05/15-09/14	30	88	205	99	88	99	88	99	0	0	88	88
2611	109	1250	9224	539	711	--	--	--	16 C	03/01-02/28	100	190	--	223	190	223	165	198	0	0	190	190
2612	110	1299	36360	781	--	--	--		27 C	03/01-02/28	100	324	--	389	324	389	146	211	0	0	324	324
2613	111	320	1500	320	--	--	--	--	7 C	03/01-02/28	100	84	--	84	84	84	84	84	0	0	84	84
2614	112	60	2565	40	--	--	--	20	1 C	03/01-02/28	100	12	--	15	12	15	12	15	0	0	12	12
2615	113	2080	6918	1850	70	--	--	160	32 C	03/01-02/28	100	382	--	408	382	408	328	354	0	0	382	382
2616	114	160	1840	80	--	--	--	80	3 C	03/01-02/28	100	38	--	48	38	48	38	48	0	0	38	38
2617	115	400	287	--	70	--	--	330	39 C	05/01-08/01	100	119	--	167	119	167	119	167	0	0	119	119
2618	116	274	382	127	--	--	--	147	8 C	03/01-02/28	100	93	--	112	93	112	93	112	0	0	93	93
2619	117	628	2869	628	--	--	--	--	14 C	03/01-02/28	100	170	--	170	170	170	170	170	0	0	170	170
2620	118	40	1360	--	--	--	40	--	1 C	03/01-02/28	100	9	--	9	9	9	9	9	0	0	9	9
2621	119	40	1560	--	40	--	--	--	1 C	03/01-02/28	100	10	--	14	10	14	10	14	0	0	10	10
2622	120	760	6080	--	120	--	640	--	12 C	03/01-02/28	100	143	--	154	143	154	54	65	0	0	143	143
2623	121	840	17180	324	516	--	--	--	17 C	03/01-02/28	100	199	--	244	199	244	30	75	0	0	199	199
3038*	528	640	1280	640	--	--	--	--	8 C	03/01-02/28	100	96	--	96	96	96	40	40	0	0	96	96
										TOTAL		295	--									
2625	123	181	2431	31	120	--	30	--	4 C	03/03-02/28	100	44	--	55	44	55	44	55	0	0	44	44
2627	125	320	1449	200	--	--	--	120	6 C	03/01-02/28	100	72	--	87	72	87	72	87	0	0	72	72
2628	126	545	2560	173	372	--	--	--	15 C	05/01-10/31	100	92	--	125	92	125	92	125	0	0	92	92
2629	127	240	1680	140	20	--	--	80	35 C	05/01-11/01	32	67	142	79	67	79	67	79	0	0	67	67
2630	128	640	1400	256	192	--	--	192	14 C	03/01-02/28	100	168	--	224	168	224	160	216	0	0	168	168
2631	129	1040	4844	584	26	--	--	430	23 C	03/01-02/28	100	268	--	324	268	324	162	218	0	0	268	268
2632	130	320	6560	--	160	--	--	160	7 C	03/01-02/28	100	84	--	138	84	138	84	138	0	0	84	84
2633	131	1280	2720	896	320	--	--	64	24 C	03/01-02/28	100	289	--	326	289	326	266	303	0	0	289	289
2634	132	218	6631	173	45	--	--	--	7 C	05/01-09/30	100	34	--	38	34	38	34	38	0	0	34	34
2635	133	1120	2400	192	70	--	77	781	100 C	04/09-05/10	100	107	--	463	360	463	360	463	0	0	360	360
									315 S	05/01-08/30	100	253	--									
										TOTAL		360	--									

YEARLONG AND SEASON AND NUMBER ALLOTMENTS (cont.)

RECORD NUMBER	ALLOT NUMBER	PUBLIC ACRES	OTHER ACRES	PUBLIC LAND RANGE CONDITION E+G	FAIR	POOR	UNKNOWN	TP	# & CLS		SEASON	% PUBLIC	CURRENT USE PUBLIC AUMS	CURRENT USE OTHER AUMS	POTENTIAL AUMS	PUBLIC ALTN. A ST	ALTN. A LT	ALTN. B ST	ALTN. B LT	ALTN. C ST	ALTN. C LT	ALTN. D ST	ALTN. D LT
2636	134	400	4131	30	--	--	--	370	10	C	03/01-02/28	100	114	--	161	114	161	88	135	0	0	114	114
2637	135	440	3050	440	--	--	--	--	7	C	03/01-02/28	100	84	--	84	84	84	70	70	0	0	84	84
2638	136	320	680	198	77	--	--	45	7	C	03/01-02/28	100	86	--	107	86	107	86	107	0	0	86	86
2639	137	4622	37466	3553	1069	--	--	--	62	C	03/02-02/28	100	74	--	805	740	805	713	788	0	0	740	740
2640	138	346	650	128	--	--	--	218	8	C	03/01-02/28	100	95	--	123	95	123	95	123	0	0	95	95
2641	139	635	5696	373	262	--	--	--	12	C	03/01-02/28	100	144	--	161	144	161	82	99	0	0	144	144
2642	140	1121	7860	622	339	--	160	--	24	C	03/01-02/28	100	281	--	311	281	311	40	70	0	0	281	281
2643	141	320	2415	320	--	--	--	--	52	C	03/02-02/28	16	99	520	171	99	171	99	171	0	0	99	99
2721*	219	680		35	--	--	--	645	98	C	03/01-02/28	16	189	987	198	189	198	187	196	0	0	189	189
											TOTAL		288	1507									
2644	142	160	1857	160	--	--	--	--	3	C	03/01-02/28	100	36	--	36	36	36	36	36	0	0	36	36
2645	143	320	7520	--	320	--	--	--	6	C	03/01-02/28	100	72	--	95	72	95	72	95	0	0	72	72
2646	144	160	3600	--	34	--	46	80	4	C	03/01-02/28	100	48	--	71	48	71	48	71	0	0	48	48
2647	145	480	1433	263	70	--	--	147	3	C	03/01-02/28	100	36	--	136	111	136	111	136	0	0	111	111
									25	Y	05/01-07/31	100	75										
											TOTAL		111	--									
2648	146	800	800	736	--	--	--	64	52	C	05/15-09/30	100	236	--	244	236	244	204	212	0	0	236	236
2649	147	2495	2755	2425	70	--	--	--	445	C	06/15-10/15	47	844	952	850	844	850	770	776	0	0	844	844
2650	148	40	1640	--	--	--	--	40	1	C	03/01-02/28	100	10	--	15	10	15	10	15	0	0	10	10
2652	150	320	1760	--	20	--	--	300	6	C	03/01-02/28	100	70	--	110	70	110	70	110	0	0	70	70
2653	151	320	4786	--	320	--	--	--	5	C	03/01-02/28	100	60	--	89	60	89	0	29	0	0	60	60
2654	152	160	4640	160	--	--	--	--	3	C	03/01-02/28	100	34	--	34	34	34	25	25	0	0	34	34
2655	153	320	6483	320	--	--	--	--	7	C	03/01-02/28	100	84	--	84	84	84	84	84	0	0	84	84
2656	154	1280	2880	403	268	--	98	511	78	C	04/01-08/15	76	267	84	355	267	355	244	332	0	0	267	267
2657	155	842	480	518	--	--	--	324	36	C	03/01-02/28	53	231	205	278	237	278	225	266	0	0	237	237
									1	H	03/01-02/28	53	6	5									
											TOTAL		237	210									
2658	156	660	3080	241	--	--	339	80	14	C	03/01-02/28	100	167	--	207	167	207	167	207	0	0	167	167
2659	157	360	2879	40	218	--	--	102	8	C	03/01-02/28	100	93	--	115	93	115	93	115	0	0	93	93
2660	158	1080	11469	1080	--	--	--	--	23	C	03/01-02/28	100	276	--	276	276	276	145	145	0	0	276	276
2662	160	40	2480	40	--	--	--	--	1	C	03/01-02/28	100	12	--	12	12	12	12	12	0	0	12	12
2663	161	840	395	420	420	--	--	--	16	C	03/01-02/28	100	195	--	233	195	233	195	233	0	0	195	195
2664	162	640	2240	640	--	--	--	--	15	C	03/01-02/28	100	174	--	174	174	174	174	174	0	0	174	174
2665	163	399	3568	346	53	--	--	--	8	C	03/01-02/28	100	97	--	102	97	102	0	5	0	0	97	97
2670	168	1194	1837	298	205	--	--	691	87	C	03/01-02/28	38	397	647	516	411	516	411	516	0	0	411	516
									3	H	03/01-02/28	38	14	22									
											TOTAL		411	669									
2671	169	1710	5040	776	--	--	934	--	212	C	03/01-02/28	18	458	2086	471	471	471	457	457	0	0	471	471
									6	H	03/01-02/28	18	13	59									
											TOTAL		471	2145									
2674	172	1880	3800	1656	173	--	--	51	343	C	03-01/02/28	26	1070	3045	1103	1082	1103	1061	1103	0	0	1082	1082
									4	H	03/01-02/28	26	12	34									
											TOTAL		1082	3079									
2678	176	640	920	525	65	--	--	50	55	C	03/01-02/28	32	212	451	225	212	225	205	218	0	0	212	212
2680	178	1214	3533	254	960	--	--	--	128	C	03/01-02/28	17	262	1274	309	277	309	277	309	0	0	277	277
									7	H	03/01-02/28	17	15	69									
											TOTAL		277	1343									

YEARLONG AND SEASON AND NUMBER ALLOTMENTS (cont.)

RECORD NUMBER	ALLOT NUMBER	PUBLIC ACRES	OTHER ACRES	PUBLIC LAND RANGE CONDITION E+G	FAIR	POOR	UNKNOWN	TP	# & CLS	SEASON	% PUBLIC	CURRENT USE PUBLIC AUMS	OTHER AUMS	POTENTIAL AUMS	PUBLIC ALTN. A ST	ALTN. A LT	ALTN. B ST	ALTN. B LT	ALTN. C ST	ALTN. C LT	ALTN. D ST	ALTN. D LT
2683	181	960	5440	864	32	--	--	64	172 C	03/01-02/28	12	248	1816	261	252	261	241	250	0	0	252	252
									3 H	03/01-02/28	12	4	32									
										TOTAL		252	1848									
2687	185	960	1280	640	320	--	--	--	77 C	03/01-02/28	28	259	690	357	270	357	270	357	0	0	270	270
										03/01-02/28	28	11	25									
									3 H	TOTAL		270	715									
2693	191	520	1925	455	65	--	--	--	10 C	03/01-02/28	100	116	--	120	116	120	108	112	0	0	116	116
2694	192	3544	11521	3058	486	--	--	--	296 C	03/01-02/28	18	640	2912	719	698	719	586	607	0	0	698	698
									5 C	03/01-02/28	100	58	--									
										TOTAL		698	2912									
2696	194	680	10385	680	--	--	--	--	12 C	03/01-02/28	100	142	--	142	142	142	121	121	0	0	142	142
2697	195	960	5714	440	240	--	--	280	163 C	03/01-02/28	10	198	1758	354	198	354	198	354	0	0	198	198
2698	196	480	3040	51	102	--	--	327	77 C	03/01-02/28	15	139	785	142	142	142	121	121	0	0	142	142
									1 H	03/01-02/28	15	3	9									
										TOTAL		142	794									
2699	197	1280	2960	768	--	--	320	192	102 C	03/01-02/28	25	306	918	333	309	333	291	315	0	0	309	309
									1 H	03/01-02/28	25	3	9									
										TOTAL		309	927									
2700	198	1280	2955	1143	--	--	32	105	101 C	03/01-02/28	25	303	909	325	312	325	292	305	0	0	312	312
									3 H	03/01-02/28	25	9	27									
										TOTAL		312	936									
2701	199	815	3600	815	--	--	--	--	85 C	03/01-02/28	15	154	866	157	157	157	157	157	0	0	157	157
									2 H	03/01-02/28	15	3	21									
										TOTAL		157	887									
2702	200	1520	3860	1505	15	--	--	--	145 C	03/01-02/28	22	391	1385	391	391	391	379	379	0	0	391	391
2703	201	390	1280	300	--	--	--	90	94 Y	05/01-11/01	23	98	328	110	98	110	0	11	0	0	98	98
2706	204	640	2273	416	224	--	--	--	70 C	06/10-08/15	100	154	--	174	154	174	129	149	0	0	154	154
2707	205	254	1280	254	--	--	--	--	6 C	03/01-02/28	100	67	--	67	67	67	0	0	0	0	67	67
2708	206	320	1820	294	26	--	--	--	7 C	03/01-02/28	100	84	--	86	84	86	80	82	0	0	84	84
2709	207	640	960	346	--	--	--	294	32 C	04/01-09/30	75	143	48	180	143	180	118	155	0	0	143	143
2710	208	320	960	--	96	--	--	224	43 C	03/01-02/28	17	88	428	125	88	125	85	122	0	0	88	88
2712	210	1440	4480	1254	--	--	--	186	135 C	05/01-05/20	87	79	11	359	335	359	8	32	0	0	335	335
									20 Y	06/01-10/01	87	53	7									
									73 C	10/01-01/06	87	203	31									
										TOTAL		335	49									
2713	211	720	1520	355	--	--	--	365	2 C	03/01-02/28	100	18	--	227	182	227	182	227	0	0	182	182
									45 C	05/20-09/07	100	164	--									
										TOTAL		182	--									
2714	212	1080	1700	869	--	--	--	211	7 C	03/01-02/28	100	89	--	330	303	330	213	240	0	0	303	303
									20 C	05/12-10/11	56	56	44									
									56 C	06/01-10/31	56	158	122									
										TOTAL		303	166									
2716	214	1560	4181	1259	51	--	--	250	8 C	03/01-02/28	100	95	--	396	360	396	351	387	0	0	360	360
									72 C	06/20-10/19	79	227	61									
									38 C	06/20-07/19	100	38	--									
										TOTAL		360	61									
2717	215	1280	2730	1069	--	--	--	211	7 C	03/01-02/28	100	80	--	342	315	342	297	324	0	0	315	315
									40 C	05/01-10/26	100	235	--									
										TOTAL		315	--									

YEARLONG AND SEASON AND NUMBER ALLOTMENTS (cont.)

RECORD NUMBER	ALLOT NUMBER	PUBLIC ACRES	OTHER ACRES	E+G	FAIR	POOR	UNKNOWN	TP	PUBLIC LAND RANGE CONDITION # & CLS	SEASON	% PUBLIC	CURRENT USE PUBLIC AUMS	CURRENT USE OTHER AUMS	POTENTIAL AUMS	PUBLIC ALTN. A ST	ALTN. A LT	ALTN. B ST	ALTN. B LT	ALTN. C ST	ALTN. C LT	ALTN. D ST	ALTN. D LT
2718	216	730	1880	332	40	--	--	358	1 C	03/01-02/28	100	12	--	231	182	231	15	64	0	0	182	182
									10 C	04/15-07/15	51	15	15									
									8 Y	04/15-07/15	51	9	9									
									30 C	05/01-07/15	51	39	39									
									35 C	05/01-10/31	51	107	107									
										TOTAL		182	170									
2719	217	920	2880	683	--	--	--	237	4 C	03/01-02/28	100	44	--	233	204	233	204	233	0	0	204	204
									59 C	06/01-10/27	46	160	129									
										TOTAL		204	129									
2720	218	778	1980	394	--	--	--	384	42 C	05/01-09/30	100	212	--	260	212	260	125	173	0	0	212	212
2722	220	2240	2240	1983	--	--	--	257	135 C	05/15-08/04	100	360	--	586	554	586	540	572	0	0	554	554
									135 C	08/05-10/07	68	194	90									
										TOTAL		554	90									
2726	224	1485	--	1165	--	--	--	320	45 C	05/15-10/14	94	212	13	212	212	212	212	212	0	0	212	212
	296	475	269	475	--	--	--	--	7 C	03/01-02/28	66	52	27	186	146	186	146	186	0	0	146	146
									32 C	10/15-02/28	66	94	50									
										TOTAL		358	90									
2729	227	3038	4360	2338	90	--	--	610	2 C	03/01-02/28	100	20	--	915	831	915	575	659	0	0	831	831
									125 C	06/01-10/24	90	540	60									
									101 C	06/01-10/24	56	271	214									
										TOTAL		831	274									
2730	228	640	2240	640	--	--	--	--	24 C	05/01-10/31	100	144	--	144	144	144	144	144	0	0	144	144
2731	229	560	1600	560	--	--	--	--	24 C	05/15-11/15	100	144	--	220	144	220	144	220	0	0	144	144
2732	230	320	720	160	--	--	20	140	8 C	03/01-02/28	100	93	--	110	93	110	93	110	0	0	93	93
2733	231	640	1215	640	--	--	--	--	14 C	03/01-02/28	100	164	--	164	164	164	154	154	0	0	164	164
2734	232	2248	1621	1738	--	--	--	510	108 C	10/15-05/14	34	256	284	680	616	680	571	635	0	0	616	616
									72 C	05/15-10/14	100	360	--									
										TOTAL		616	284									
2735	233	3106	1600	2526	--	--	90	490	15 C	03/01--2/28	100	176	--	885	823	885	700	762	0	0	823	823
									50 C	05/01-09/30	66	166	85									
									92 C	06/15-12/14	71	392	252									
									50 C	10/01-12/14	71	89	36									
										TOTAL		823	373									
2736	234	320	640	240	--	--	40	40	8 C	03/01-02/28	100	90	--	95	90	95	90	95	0	0	90	90
2739	237	1300	2280	850	--	--	--	450	24 C	05/01-10/30	100	144	--	144	144	144	144	144	0	0	144	144
	238	1031	2672	681	200	--	--	150	3 C	03/01-02/28	100	36	--	280	250	280	250	280	0	0	250	250
									136 C	04/01-04/30	36	49	87									
									112 C	05/01-07/21	36	109	193									
									25 C	07/22-11/30	36	56	99									
										TOTAL		250	379									
2740	239	560	720	560	--	--	--	--	13 C	03/01-02/28	100	152	--	152	152	152	0	0	0	0	152	152
2741	240	160	2560	160	--	--	--	--	4 C	03/01-02/28	100	46	--	46	46	46	34	34	0	0	46	46
2742	241	925	3840	925	--	--	--	--	105 C	05/15-10/14	47	247	278	247	247	247	231	231	0	0	247	247
2743	242	960	2560	520	--	--	240	200	25 C	03/01-02/28	100	296	--	321	296	321	296	321	0	0	296	296

YEARLONG AND SEASON AND NUMBER ALLOTMENTS (continued)

RECORD NUMBER	ALLOT NUMBER	PUBLIC ACRES	OTHER ACRES	PUBLIC LAND RANGE CONDITION E+G	FAIR	POOR	UNKNOWN	TP	# & CLS		SEASON	% PUBLIC	CURRENT USE PUBLIC AUMS	CURRENT USE OTHER AUMS	POTENTIAL AUMS	PUBLIC ALTN. A ST	ALTN. A LT	ALTN. B ST	ALTN. B LT	ALTN. C ST	ALTN. C LT	ALTN. D ST	ALTN. D LT
2746	245	360	1617	360	--	--	--	--	7	C	03/01-02/28	100	89	--	89	89	89	0	0	0	0	89	89
2749	248	800	1128	520	240	--	40	--	16	C	03/01-02/28	100	193	--	215	193	215	186	208	0	0	193	193
2751	250	960	2869	960	--	--	--	--	21	C	03/01-02/28	100	256	--	256	256	256	73	73	0	0	256	256
2753	252	6056	IN#2155	5706	--	--	--	350	134	C	03/01-02/28	100	1603	--	1647	1603	1647	1423	1467	0	0	1603	1603
2754	253	19750	31699	19217	240	--	100	193	330	C	01/01-06/30	33	656	1654	6202	5937	6202	4777	5042	0	0	5937	5937
									726	C	07/01-12/31	61	2658	1698									
									314	C	11/11-03/31	29	419	1046									
									396	C	01/01-06/30	49	1165	1607									
									396	C	01/01-06/30	10	238	2534									
									588	C	04/01-11/10	16	690	3622									
									20	H	03/01-02/28	46	111	129									
											TOTAL		5937	12290									
2756	255	960	3524	890	--	--	--	70	21	C	03/01-02/28	100	246	--	255	246	255	246	255	0	0	246	246
2757	256	3663	3841	3663	--	--	--	--	48	C	06/01-10/30	100	240	--	240	240	240	240	240	0	0	240	240
	257	320	--	160	--	--	--	160	7	C	03/01-02/28	100	88	--	108	88	108	88	108	0	0	88	88
2758	258	320	5080	110	--	--	--	210	8	C	03/01-02/28	100	96	--	123	96	123	96	123	0	0	96	96
2759	259	320	2567	50	--	--	--	270	8	C	03/01-02/28	100	96	--	130	96	130	96	130	0	0	96	96
2761	261	320	2955	100	--	--	40	180	7	C	03/01-02/28	100	84	--	107	84	107	84	107	0	0	84	84
2764	264	200	2760	200	--	--	--	--	2	C	03/01-02/28	100	24	--	24	24	24	22	22	0	0	24	24
2765	265	1421	1020	1371	50	--	--	--	65	C	04/01-10/31	69	314	141	320	319	320	286	287	0	0	319	319
									2	C	06/11-09/10	69	5	1									
											TOTAL		319	142									
2766	266	2957	1297	2767	190	--	--	--	115	C	12/10-04/30	26	141	396	861	844	861	67	84	0	0	844	844
									121	C	05/01-10/31	97	703	23									
											TOTAL		844	419									
2767	237	--	2701			In	2739-237	--	30	C	05/01-10/31	100	180	--	180	180	180	179	179	0	0	180	180
2768	256	--	1194			In	2757-256	--	33	C	05/01-10/31	100	198	--	198	198	198	133	133	0	0	198	198
2769	256	--	2788			In	2757-256	--	54	C	05/15-10/14	100	271	--	271	271	271	206	206	0	0	271	271
2770	293	3042	1280	2882	--	--	--	160	28	C	06/01-10/31	84	121	19	141	121	141	0	0	0	0	121	121
2771	267	281	4920	281	--	--	--	--	21	C	07/01-10/31	100	84	--	84	84	84	84	84	0	0	84	84
2772	369	2089	--	2089	--	--	--	--	43	C	04/01-11/15	51	168	155	170	168	170	168	170	0	0	168	168
2775	271	560	2880	560	--	--	--	--	24	C	05/10-11/09	100	144	--	144	144	144	144	144	0	0	144	144
2776	256	--	--	--	--	In	2757-256	--	72	C	05/04-10/31	100	404	--	404	404	404	339	339	0	0	404	404
	272	4187	4819	3307	640	--	80	160	173	C	03/01-02/28	12	249	1827	1367	1121	1367	1074	1320	0	0	1121	1121
									250	Y	04/01-10/14	72	872	347									
	293	--	--		--	In	2770-293	--	52	C	05/01-10/31	84	262	50	262	262	262	82	82	0	0	262	262
											TOTAL		1787	2224									

YEARLONG AND SEASON AND NUMBER ALLOTMENTS (continued)

RECORD NUMBER	ALLOT NUMBER	PUBLIC ACRES	OTHER ACRES	E+G	FAIR	POOR	UNKNOWN	TP	PUBLIC LAND RANGE CONDITION # & CLS		SEASON	% PUBLIC	CURRENT USE PUBLIC AUMS	CURRENT USE OTHER AUMS	POTENTIAL AUMS	PUBLIC ALTN. A ST	PUBLIC ALTN. A LT	PUBLIC ALTN. B ST	PUBLIC ALTN. B LT	PUBLIC ALTN. C ST	PUBLIC ALTN. C LT	PUBLIC ALTN. D ST	PUBLIC ALTN. D LT
2777	273	3024	1917	2754	--	--	--	270	199	C	12/01-03/31	35	277	519	1243	1209	1243	960	994	0	0	1209	1209
									10	H	12/01-03/31	35	14	26									
									199	C	04/01-11/30	55	874	718									
									10	H	04/01-11/13	55	44	56									
											TOTAL		1209	1319									
2778	274	4628	3077	3248	210	--	290	880	23	C	03/01-02/28	100	535	--	1490	1362	1490	969	969	0	0	1362	1362
									121	C	04/01-11/15	52	827	763									
											TOTAL		1362	763									
2779	275	1926	5760	1926	--	--	--	--	236	C	04/01-12/01	25	475	1431	475	475	475	464	464	0	0	475	475
2780	276	7598	5030	6948	560	--	90	--	26	C	03/01-02/28	100	310	--	1813	1777	1813	1594	1630	0	0	1777	1777
									460	C	05/01-10/09	60	1467	971									
											TOTAL		1777	971									
2781	277	2040	3095	1650	--	--	140	250	112	C	04/16-11/30	64	537	303	569	537	569	537	569	0	0	537	537
2782	278	1120	6196	520	20	--	--	580	175	C	12/01-03/31	22	154	546	411	336	411	336	411	0	0	336	336
									175	C	05/01-05/30	22	39	136									
									97	C	05/01-07/31	49	143	148									
											TOTAL		336	830									
2783	279	851	779	561	90	--	40	160	50	C	04/15-08/07	100	188	--	216	188	216	188	216	0	0	188	188
2784	280	320	4643	180	--	--	--	140	8	C	03/01-02/28	100	90	--	108	90	108	90	108	0	0	90	90
2785	281	480	3680	420	--	--	--	60	11	C	03/01-02/28	100	128	--	136	128	136	128	136	0	0	128	128
2788	284	4793	7793	4733	--	--	--	60	100	C	12/01-04/30	8	40	460	1355	1341	1355	1254	1268	0	0	1341	1341
									150	C	12/01-04/30	29	218	532									
									117	C	11/15-05/14	29	204	498									
									5	H	11/15-05/14	29	9	21									
									250	C	05/01-11/29	50	870	870									
											TOTAL		1341	2381									
2789	285	1135	1281	1025	60	--	--	50	57	C	04/01-11/30	66	302	154	313	302	313	282	293	0	0	302	302
2790	286	2524	6173	2434	50	--	40	--	244	C	12/01-05/31	38	556	908	713	709	713	120	124	0	0	709	709
									5	H	12/01-05/31	38	12	18									
									70	S	12/01-05/31	38	32	52									
									210	C	06/01-11/29	8	100	1160									
									5	H	06/01-11/29	8	2	28									
									70	S	06/01-11/29	8	7	77									
											TOTAL		709	2243									
2791	287	2980	2870	2770	--	--	50	160	125	C	05/15-10/14	100	630	--	646	630	646	296	312	0	0	630	630
2794	290	2114	4600	1474	--	--	180	460	5	C	03/01-02/28	100	60	--	638	576	638	355	417	0	0	576	576
									52	C	05/01-12/31	100	416	--									
									45	C	05/01-11/30	32	100	170									
											TOTAL		576	170									
	293					In #	2770-293	--	71	C	05/15-10/31	84	328	62	328	328	328	103	103	0	0	328	328
2795	291	10	285	--	--	--	10	--	1	C	03/01-02/28	100	5	--	5	5	5	5	5	0	0	5	5
2797	369	2089	2390	2039	50	--	--	--	46	C	05/01-11/30	51	168	154	170	168	170	74	76	0	0	168	168
2798	287					In #	2791-287	--	27	C	05/20-11/19	100	162	--	166	162	166	162	166	0	0	162	162
	293					In #	2770-293	--	26	C	05/20-11/19	84	131	25	131	131	131	41	41	0	0	131	131
	294	989	5522	529	--	--	--	460	24	C	03/01-02/28	100	287	--	345	287	345	0	0	0	0	287	287
											TOTAL		580	25									

YEARLONG AND SEASON AND NUMBER ALLOTMENTS (continued

RECORD NUMBER	ALLOT NUMBER	PUBLIC ACRES	OTHER ACRES	PUBLIC LAND RANGE CONDITION E+G	FAIR	POOR	UNKNOWN	TP	# & CLS		SEASON	% PUBLIC	CURRENT USE PUBLIC AUMS	CURRENT USE OTHER AUMS	POTENTIAL AUMS	PUBLIC ALTN. A ST	PUBLIC ALTN. A LT	PUBLIC ALTN. B ST	PUBLIC ALTN. B LT	PUBLIC ALTN. C ST	PUBLIC ALTN. C LT	PUBLIC ALTN. D ST	PUBLIC ALTN. D LT
2801	297	1833	--	1433	190	--	--	210	56	C	12/01-03/31	25	58	166	489	445	489	401	445	0	0	445	445
									56	C	04/01-05/31	77	87	105									
									2	H	04/01-05/31	77	4	--									
									56	C	06/01-10/30	85	286	64									
									2	H	06/01-11/30	85	10	2									
											TOTAL		445	337									
2806	302	640	960	20	560	--	60	--	34	C	05/01-10/15	100	191	--	241	191	241	191	241	0	0	191	191
2809	305	1279	1750	1279	--	--	--	--	52	C	05/01-10/31	100	312	--	312	312	312	312	312	0	0	312	312
2811	307	491	427	231	260	--	--	--	34	C	04/19-12/14	49	129	137	163	129	163	129	163	0	0	129	129
2812	308	310	973	150	--	--	160	--	6	C	03/01-02/28	100	75	--	75	75	75	61	61	0	0	75	75
2813	309	306	1257	306	--	--	--	--	6	C	03/01-02/28	100	68	--	78	68	78	0	0	0	0	68	68
	579	640	--	560	--	--	--	80	51	C	05/01-10/31	46	141	165	141	141	141	0	0	0	0	141	141
2814	311	148	161	--	--	--	148	--	6	C	03/01-02/28	100	74	--	91	74	91	74	91	0	0	74	74
2820	318	298	1020	298	--	--	--	--	43	C	05/20-10/25	32	71	153	71	71	71	65	65	0	0	71	71
2821	319	1637	1760	1327	310	--	--	--	58	C	05/01-10/31	98	345	3	458	345	458	118	231	0	0	345	345
2823	321	640	--	320		170	--	320	91	C	06/01-07/31	100	182	--	340	182	340	182	340	0	0	182	182
2824	322	320	165	270	--	--	--	50	7	C	03/01-02/28	100	84	--	91	84	91	84	91	0	0	84	84
2825	324	774	3148	774	--	--	--	--	37	C	05/01-10/31	100	224	--	224	224	224	216	216	0	0	224	224
2830	328	1600	2431	--	--	--	--	--	30	C	03/01-02/28	100	355	--	355	355	355	340	340	0	0	355	355
	577	1335	--	1545	--	--	1390	--	205	C	05/15-11/14	30	368	862	368	368	368	368	368	0	0	368	368
											TOTAL		723	862									
2833	331	320	800	--	110	--	--	210	8	C	03/01-02/28	100	90	--	126	90	126	90	126	0	0	90	90
	579					In #	2813-579		9	C	05/01-10/31	46	25	29	25	25	25	0	0	0	0	25	25
											TOTAL		115	29									
2834	332	160	1440	160	--	--	--	--	3	C	03/01-02/28	100	35	--	35	35	35	35	35	0	0	35	35
2835	333	1371	480	701	20	40	--	610	54	C	05/01-11/30	78	295	83	374	295	374	279	358	0	0	295	295
2836	334	2274	8247	1524	280	--	--	470	243	C	03/01-02/28	16	466	2450	550	466	550	444	528	0	0	466	466
2837	335	320	1135	180	20	--	--	120	7	C	03/01-02/28	100	81	--	98	81	98	81	98	0	0	81	81
2839	337	958	913	378	250	--	--	330	53	C	04/01-11/30	57	242	182	305	242	305	242	305	0	0	242	242
2840	338	640	1904	390	--	--	--	250	36	C	04/15-11/15	60	163	89	195	163	195	135	167	0	0	163	163
2841	339	2615	3414	2365	70	--	40	140	8	C	03/01-02/28	100	92	--	669	645	669	316	340	0	0	645	645
									113	C	06/01-11/10	92	553	48									
											TOTAL		645	48									
2842	340	1289	1460	789	90	--	--	410	99	C	05/01-11/30	45	309	384	369	309	369	309	369	0	0	309	309
2843	341	12360	1628	11010	880	--	40	430	70	C	04/15-11/30	90	473	52	833	790	833	668	711	0	0	790	790
									63	C	05/15-11/01	90	317	30									
											TOTAL		790	122									
2844	342	160	1976	160	--	--	--	--	3	C	03/01-02/28	100	30	--	30	30	30	0	0	0	0	30	30
	368	1503	--	1203	275	--	25	--	50	C	05/15-10/14	71	178	72	202	178	202	0	0	0	0	178	178
											TOTAL		208	72									
2847	343	2292	3835	2172	80	--	40	--	65	H	03/01-02/28	11	86	694	474	472	474	441	443	0	0	472	472
									150	C	12/01-05/31	7	64	836									
									158	C	06/01-11/30	34	322	626									
											TOTAL		472	2156									
2849	345	3550	4076	1690	410	--	420	1030	344	C	05/01-11/01	52	1073	990	1239	1073	1239	164	330	0	0	1073	1073
2850	346	1830	4000	1500	--	--	--	330	117	C	04/15-11/14	56	455	364	497	455	497	308	350	0	0	455	455
2852	348	606	2569	606	--	--	--	--	70	C	05/01-10/31	32	135	285	135	135	135	135	135	0	0	135	135
2853	349	430	759	--	--	--	430	--	10	C	03/01-02/28	100	122		124	124	124	124	124	0	0	124	124

YEARLONG AND SEASON AND NUMBER ALLOTMENTS (continued)

RECORD NUMBER	ALLOT NUMBER	PUBLIC ACRES	OTHER ACRES	E+G	FAIR	POOR	UNKNOWN	TP	PUBLIC LAND RANGE CONDITION # & CLS	SEASON	% PUBLIC	CURRENT USE PUBLIC AUMS	CURRENT USE OTHER AUMS	POTENTIAL AUMS	PUBLIC ALTN. A ST	ALTN. A LT	ALTN. B ST	ALTN. B LT	ALTN. C ST	ALTN. C LT	ALTN. D ST	ALTN. D LT
2854	310	2460	--	2460	--	--	--	--	44 C	05/01-10/31	100	264	--	264	264	264	208	208	0	0	264	264
	350	40	2545	40	--	--	--	--	1 C	03/01-02/28	100	12	--	12	12	12	12	12	0	0	12	12
										TOTAL		226										
2855	351	640	2250	160	480	--	--	--	62 C	06/01-10/30	50	156	156	192	156	192	0	36	0	0	156	156
2856	352	1157	1839	837	320	--	--	--	3 C	03/01-02/28	100	30	--	284	260	284	88	112	0	0	260	260
									120 C	05/10-10/31	33	230	450									
										TOTAL		260	450									
2857	353	1680	4034	1440	140	--	40	60	55 C	05/01-10/31	17	57	273	365	350	365	83	98	0	0	350	350
									53 C	05/15-10/31	100	293	--									
										TOTAL		350	273									
2858	367	1920	2040	1920	--	--	--	--	63 C	05/01-10/31	89	336	42	336	336	336	336	336	0	0	336	336
2859	310					In #	2854-310		63 C	05/01-11/01	100	380	--	380	380	380	380	380	0	0	380	380
	354	160	1262	--	--	--	80	80	4 C	03/01-02/28	100	47	--	57	47	57	47	57	0	0	47	47
										TOTAL		427										
2860	355	1320	1320	770	140	--	80	330	47 C	05/01-10/31	100	283	--	466	466	466	466	466	0	0	466	466
									35 C	05/01-10/31	87	183	27									
										TOTAL		466	27									
2862	357	3044	2593	2764	--	--	60	220	143 C	04/01-06/30	100	429	--	777	749	777	536	564	0	0	749	749
									157 C	07/01-09/30	52	246	225									
									157 C	10/01-02/28	9	74	554									
										TOTAL		749	779									
2863	358	40	741	20	20	--	--	--	1 C	03/01-02/28	100	11	--	11	11	11	11	11	0	0	11	11
2864	484	595	320	295	275	--	25	--	43 C	05/15-10/14	71	153	62	177	153	177	0	0	0	0	153	153
2865	359	2875	2415	2815	--	--	--	60	158 C	05/01-10/31	79	754	194	762	754	762	487	495	0	0	754	754
2866	367	--	800			In #	2858-367	--	23 C	05/01-10/31	89	123	15	123	123	123	98	98	0	0	123	123
	482	977	960	677	275	--	25	--	69 C	05/15-10/14	71	245	100	269	245	269	0	0	0	0	245	245
										TOTAL		368	115									
2867	483	1749	160	1449	275	--	25	--	60 C	05/15-10/14	71	213	87	237	213	237	0	0	0	0	245	245
2868	360	490	1200	230	160	--	20	80	39 C	05/15-10/10	42	81	109	97	81	97	0	9	0	0	81	81
2869	341	--	--			In #	2843-341	--	171 C	05/01-10/31	90	922	104	978	922	978	779	835	0	0	922	922
	361	624	3519	624	--	--	--	--	35 C	06/01-10/31	100	175	--	175	175	175	152	152	0	0	175	175
										TOTAL		1097	104									
2870	371	29	372	--	--	--	29	--	1 Y	03/01-02/28	100	3	--	3	3	3	3	3	0	0	3	3
2871	341	--	2760			In #	2843-341	--	76 C	05/01-10/31	90	413	43	437	413	437	349	373	0	0	413	413
2872	362	2736	2445	206	790	70	60	1610	122 C	04/10-10/21	100	780	--	1053	780	1053	780	1053	0	0	780	780
2874	364	1857	1441	1637	--	--	--	220	2 C	03/01-02/28	100	22	--	538	510	538	465	493	0	0	510	510
									94 C	05/01-11/30	69	488	170									
										TOTAL		510	170									
2875	365	2156	1241	2156	--	--	--	--	88 C	04/20-10/19	100	530	--	530	530	530	491	491	0	0	530	530
2876	366	646	1200	326	320	--	--	--	84 C	05/01-08/30	44	147	189	176	147	176	147	176	0	0	147	147
2877	578	2532	3252	2022	--	--	50	460	50 C	03/01-02/28	100	603	--	661	603	661	585	643	0	0	603	603
2881	373	80	2480	80	--	--	--	--	4 C	04/01-10/31	100	24	--	24	24	24	24	24	0	0	24	24
2882	372	48	385	48	--	--	--	--	1 C	03/01-02/28	100	4	--	4	4	4	4	4	0	0	4	4
2884	374	80	201	64	16	--	--	--	2 C	03/01-02/28	100	20	--	22	20	22	0	0	0	0	20	20
2885	375	40	9320	40	--	--	--	--	1 C	03/01-02/28	100	10	--	10	10	10	0	0	0	0	10	10
2886	376	320	2880	320	--	--	--	--	6 C	03/01/02/28	100	70	--	70	70	70	55	55	0	0	70	70
2887	377	160	3040	141	19	--	--	--	2 C	03/01-02/28	100	24	--	26	24	26	24	26	0	0	24	24
2888	378	960	2640	960	--	--	--	--	16 C	03/01-02/28	100	193	--	193	193	193	179	179	0	0	193	193

YEARLONG AND SEASON AND NUMBER ALLOTMENTS (continued)

RECORD NUMBER	ALLOT NUMBER	PUBLIC ACRES	OTHER ACRES	E+G	PUBLIC LAND RANGE CONDITION FAIR	POOR	UNKNOWN	TP	# & CLS	SEASON	% PUBLIC	CURRENT USE PUBLIC AUMS	CURRENT USE OTHER AUMS	POTENTIAL AUMS	PUBLIC ALTN. A ST	ALTN. A LT	ALTN. B ST	ALTN. B LT	ALTN. C ST	ALTN. C LT	ALTN. D ST	ALTN. D LT
2889	379	640	3200	640	--	--	--	--	9 C	03/01-02/28	100	108	--	108	108	108	108	108	0	0	108	108
2890	380	36	3135	36	--	--	--	--	2 C	03/01-02/28	100	18	--	18	18	18	18	18	0	0	18	18
2891	381	640	11592	545	95	--	--	--	12 C	03/01-02/28	100	147	--	156	147	156	110	119	0	0	147	147
2892	382	360	1880	360	--	--	--	--	7 C	03/01-02/28	100	83	--	83	83	83	74	74	0	0	83	83
2893	383	80	12400	80	--	--	--	--	1 C	03/01-02/28	100	14	--	14	14	14	10	10	0	0	14	14
2894	384	80	4400	80	--	--	--	--	2 C	03/01-02/28	100	20	--	20	20	20	20	20	0	0	20	20
2895	385	771	3629	531	200	40	--	--	6 C	03/01-02/28	100	68	--	94	68	94	65	91	0	0	68	68
	438	6160	--	5847	313	--	--	--	70 C	04/01-10/31	44	217	273	226	217	226	96	105	0	0	217	217
										TOTAL		285	273									
2896	386	3120	17449	2750	370	--	--	--	46 C	03/01-02/28	100	552	--	585	552	585	484	517	0	0	552	552
2897	387	640	6400	640	--	--	--	--	10 C	03/01-02/28	100	115	--	115	115	115	100	100	0	0	115	115
2898	388	101	6651	101	--	--	--	--	2 C	03/01-02/28	100	20	--	20	20	20	3	3	0	0	20	20
2899	389	320	640	320	--	--	--	--	6 C	03/01-02/28	100	74	--	74	74	74	74	74	0	0	74	74
2900	390	205	10135	205	--	--	--	--	15 S	03/01-02/28	100	34	--	34	34	34	27	27	0	0	34	34
2901	391	320	3040	320	--	--	--	--	3 C	03/01-02/28	100	33	—	33	33	33	26	26	0	0	33	33
2902	392	958	2560	512	446	--	--	--	140 C	05/10-07/07	41	110	161	130	110	130	110	130	0	0	110	110
2903	393	280	1280	280	--	--	--	--	4 C	03/01-02/28	100	48	--	48	48	48	0	0	0	0	48	48
2904	394	120	2360	120	--	--	--	--	2 C	03/01-02/28	100	26	--	26	26	26	22	22	0	0	26	26
2905	395	40	480	40	--	--	--	--	1 C	03/01-02/28	100	11	--	11	11	11	0	0	0	0	11	11
2906	392	958	3727	958	--	--	--	--	108 C	05/15-07/31	41	110	160	130	110	130	82	102	0	0	110	110
2907	397	960	10970	960	--	--	--	--	15 C	03/01-02/28	100	183	--	183	183	183	160	160	0	0	183	183
2908	398	360	2840	360	--	--	--	--	8 C	03/01-02/28	100	97	--	97	97	97	85	85	0	0	97	97
2909	399	160	5373	160	--	--	--	--	4 C	03/01-02/28	100	48	--	48	48	48	40	40	0	0	48	48
2910	400	1280	7040	1280	--	--	--	--	17 C	03/01-02/28	100	202	--	202	202	202	183	183	0	0	202	202
2912	402	320	960	320	--	--	--	--	5 C	03/01-02/28	100	56	--	56	56	56	56	56	0	0	56	56
2997*	487	320	6960	320	--	--	--	--	8 C	03/01-02/28	100	107	--	107	107	107	10	10	0	0	107	107
										TOTAL		163										
2913	403	320	3280	320	--	--	--	--	5 C	03/01-02/28	100	57	--	57	57	57	49	49	0	0	57	57
2914	404	720	3440	720	--	--	--	--	12 C	03/01-02/28	100	144	--	144	144	144	52	52	0	0	144	144
2915	405	1999	13370	1862	137	--	--	--	25 C	03/01-02/28	100	298	--	310	298	310	222	234	0	0	298	298
2916	406	71	4615	71	--	--	--	--	1 C	03/01-02/28	100	13	--	13	13	13	0	0	0	0	13	13
2917	407	200	3818	200	--	--	--	--	3 C	03/01-02/28	100	40	--	40	40	40	35	35	0	0	40	40
2918	408	720	6000	720	--	--	--	--	13 C	03/01-02/28	100	161	--	161	161	161	109	109	0	0	161	161
2919	409	40	4520	40	--	--	--	--	1 C	03/01-02/28	100	10	--	10	10	10	0	0	0	0	10	10
2920	410	117	316	117	--	--	--	--	2 C	03/01-02/28	100	27	--	27	27	27	22	22	0	0	27	27
2921	411	147	1709	147	--	--	--	--	3 C	03/01-02/28	100	32	--	32	32	32	12	12	0	0	32	32
2922	412	1200	8631	900	300	--	--	--	20 C	03/01-02/28	100	243	--	270	243	270	210	237	0	0	243	243
2923	413	80	3736	80	--	--	--	--	2 C	03/01-02/28	100	24	--	24	24	24	18	18	0	0	24	24
2925	415	560	--	560	--	--	--	--	130 C	10/16-12/31	23	75	250	75	75	75	0	0	0	0	75	75
	438	--	8509			In #	2895-438		128 C	04/01-11/30	44	451	573	470	451	470	199	218	0	0	451	451
	439	36	--	36	--	--	--	--	1 C	03/01-02/28	100	11	--	11	11	11	11	11	0	0	11	11
	440	4460	--	4460	--	--	--	--	137 C	05/01-10/15	59	444	310	684	684	684	684	684	0	0	684	684
									15 H	05/16-10/15	59	44	31									
									51 C	04/01-10/15	59	196	136									
										TOTAL		1221	1075									
2926	416	1037	21982	970	67	--	--	--	16 C	03/01-02/28	100	192	--	198	192	198	162	168	0	0	192	192

YEARLONG AND SEASON AND NUMBER ALLOTMENTS (continued)

RECORD NUMBER	ALLOT NUMBER	PUBLIC ACRES	OTHER ACRES	E+G	FAIR	POOR	UNKNOWN	PUBLIC LAND RANGE CONDITION TP	# & CLS	SEASON	% PUBLIC	CURRENT USE PUBLIC AUMS	CURRENT USE OTHER AUMS	POTENTIAL AUMS	PUBLIC ALTN. A ST	ALTN. A LT	ALTN. B ST	ALTN. B LT	ALTN. C ST	ALTN. C LT	ALTN. D ST	ALTN. D LT
2927	417	80	1840	80	--	--	--	--	2 C	03/01-02/28	100	24	--	24	24	24	21	21	0	0	24	24
2928	418	39	1880	39	--	--	--	--	1 C	03/01-02/28	100	11	--	11	11	11	11	11	0	0	11	11
2929	419	720	520	720	--	--	--	--	8 C	03/01-02/28	100	94	--	94	94	94	78	78	0	0	94	94
2930	420	133	3489	83	50	--	--	--	3 C	03/01-02/28	100	30	--	34	30	34	24	28	0	0	30	30
2931	421	22	576	22	--	--	--	--	1 C	03/01-02/28	100	12	--	12	12	12	12	12	0	0	12	12
2933	423	242	3282	242	--	--	--	--	5 C	03/01-02/28	100	60	--	60	60	60	57	57	0	0	60	60
2934	424	720	2200	720	--	--	--	--	13 C	03/01-02/28	100	152	--	152	152	152	118	118	0	0	152	152
2935	425	480	1754	110	370	--	--	--	8 C	03/01-02/28	100	89	--	122	89	122	80	113	0	0	89	89
2936	426	365	5825	165	162	38	--	--	8 C	03/01-02/28	100	100	--	123	100	123	78	101	0	0	100	100
2937	427	2444	18209	2444	--	--	--	--	54 C	03/01-02/28	100	648	--	648	648	648	648	648	0	0	648	648
3044*	534	960	21000	930	30	--	--	--	20 C	03/01-02/28	100	240	--	242	240	242	116	118	0	0	240	240
										TOTAL		888										
2938	428	89	6008	89	--	--	--	--	5 C	05/15-10/31	100	27	--	27	27	27	20	20	0	0	27	27
2939	429	200	6199	200	--	--	--	--	4 C	03/01-02/28	100	48	--	48	48	48	38	38	0	0	48	48
2940	430	200	3496	200	--	--	--	--	5 C	03/01-02/28	100	63	--	63	63	63	55	55	0	0	63	63
2942	432	320	4800	320	--	--	--	--	6 C	03/01-02/28	100	76	--	76	76	76	38	38	0	0	76	76
2943	433	160	9695	160	--	--	--	--	3 C	03/01-02/28	100	36	--	36	36	36	8	8	0	0	36	36
2944	434	2074	8001	2034	40	--	--	--	35 C	03/01-02/28	100	416	--	420	416	420	344	348	0	0	416	416
2945	435	80	12259	80	--	--	--	--	2 C	03/01-02/28	100	24	--	24	24	24	0	0	0	0	24	24
2947	437	37	1480	37	--	--	--	--	3 C	10/01-12/31	100	10	--	10	10	10	0	0	0	0	10	10
2948	441	40	4120	40	--	--	--	--	1 C	03/01-02/28	100	11	--	11	11	11	11	11	0	0	11	11
2949	442	160	640	160	--	--	--	--	3 C	03/01-02/28	100	39	--	39	39	39	33	33	0	0	39	39
2951	441	560	645	560	--	--	--	--	13 C	03/01-02/28	100	153	--	153	153	153	142	142	0	0	153	153
2952	442	477	840	477	--	--	--	--	8 C	03/01-02/28	100	100	--	100	100	100	91	91	0	0	100	100
2953	443	160	4560	160	--	--	--	--	2 C	03/01-02/28	100	29	--	29	29	29	27	27	0	0	29	29
2954	444	320	5120	320	--	--	--	--	8 C	03/01-02/28	100	92	--	92	92	92	69	69	0	0	92	92
2955	445	360	3240	360	--	--	--	--	10 C	03/01-02/28	100	122	--	122	122	122	107	107	0	0	122	122
2956	446	680	9040	680	--	--	--	--	12 C	03/01-02/28	100	138	--	138	138	138	123	123	0	0	138	138
2961	451	80	1460	80	--	--	--	--	2 C	03/01-02/28	100	28	--	28	28	28	26	26	0	0	28	28
2962	452	200	2796	200	--	--	--	--	5 C	03/01-02/28	100	58	--	58	58	58	52	52	0	0	58	58
2963	453	99	200	99	--	--	--	--	2 C	03/01-02/28	100	25	--	25	25	25	25	25	0	0	25	25
2964	454	320	1280	294	--	26	--	--	8 C	03/01-02/28	100	92	--	98	92	98	69	75	0	0	92	92
2965	455	160	7420	160	--	--	--	--	3 C	03/01-02/28	100	30	--	30	30	30	24	24	0	0	30	30
2966	456	80	4346	80	--	--	--	--	2 C	03/01-02/28	100	26	--	26	26	26	23	23	0	0	26	26
2967	457	160	5790	90	35	35	--	--	4 C	03/01-02/28	100	50	--	60	50	60	37	47	0	0	50	50
2968	458	244	3426	230	14	--	--	--	7 C	03/01-02/28	100	82	--	83	82	83	75	76	0	0	82	82
2969	459	80	960	80	--	--	--	--	15 S	03/01-02/28	100	23	--	23	23	23	19	19	0	0	23	23
2971	461	371	7000	71	300	--	--	--	8 C	03/01-02/28	100	99	--	126	99	126	82	109	0	0	99	99
2972	462	160	1440	160	--	--	--	--	5 C	03/01-02/28	100	59	--	59	59	59	48	48	0	0	59	59
2973	463	200	520	200	--	--	--	--	6 C	03/01-02/28	100	68	--	68	68	68	54	54	0	0	68	68
2974	464	401	15280	401	--	--	--	--	10 C	03/01-02/28	100	115	--	115	115	115	92	92	0	0	115	115
2976	466	120	5000	120	--	--	--	--	2 C	03/01-02/28	100	24	--	24	24	24	21	21	0	0	24	24
2977	467	320	9840	320	--	--	--	--	5 C	03/01-02/28	100	64	--	64	64	64	60	60	0	0	64	64
2978	468	400	2600	355	45	--	--	--	11 C	03/01-02/28	100	134	--	138	134	138	127	131	0	0	134	134
2979	469	160	1920	160	--	--	--	--	5 C	03/01-02/28	100	53	--	53	53	53	45	45	0	0	53	53
2980	470	969	680	935	34	--	--	--	23 C	03/01-02/28	100	270	--	273	270	273	257	260	0	0	270	270

YEARLONG AND SEASON AND NUMBER ALLOTMENTS (continued)

RECORD NUMBER	ALLOT NUMBER	PUBLIC ACRES	OTHER ACRES	PUBLIC LAND RANGE CONDITION E+G	FAIR	POOR	UNKNOWN	TP	# & CLS		SEASON	% PUBLIC	CURRENT USE PUBLIC AUMS	OTHER AUMS	POTENTIAL AUMS	PUBLIC ALTN. A ST	A LT	ALTN. B ST	B LT	ALTN. C ST	C LT	ALTN. D ST	D LT
2981	471	1004	4880	973	31	--	--	--	22	C	03/01-02/28	100	268	--	270	268	270	198	200	0	0	268	268
2982	472	712	5000	649	63	--	--	--	16	C	03/01-02/28	100	188	--	194	188	194	162	178	0	0	188	188
2983	473	1071	4360	901	170	--	--	--	28	C	03/01-02/28	100	330	--	345	330	345	267	282	0	0	330	330
2986	476	120	2440	120	--	--	--	--	2	C	03/01-02/28	100	24	--	24	24	24	22	22	0	0	24	24
2987	477	415	680	357	58	--	--	--	7	C	03/01-02/28	100	79	--	84	79	84	58	63	0	0	79	79
2988	478	80	1440	80	--	--	--	--	2	C	03/01-02/28	100	20	--	20	20	20	16	16	0	0	20	20
2990	480	320	2880	320	--	--	--	--	4	C	03/01-02/28	100	50	--	50	50	50	0	0	0	0	50	50
2991	481	628	160	548	60	20	--	--	14	C	03/01-02/28	100	167	--	176	167	176	70	79	0	0	167	167
2993	483	1600	9465	1600	--	--	--	--	24	C	03/01-02/28	100	288	--	288	288	288	230	230	0	0	288	288
2998	488	200	3000	200	--	--	--	--	5	C	03/01-02/28	100	62	--	62	62	62	56	56	0	0	62	62
3000	490	80	600	80	--	--	--	--	2	C	03/01-02/28	100	22	--	22	22	22	16	16	0	0	22	22
3001	491	66	3280	26	40	--	--	--	2	C	03/01-02/28	100	20	--	24	20	24	18	22	0	0	20	20
3002	492	40	2918	--	40	--	--	--	1	C	03/01-02/28	100	8	--	12	8	12	8	12	0	0	8	8
3003	493	1713	5905	1683	30	--	--	--	27	C	03/01-02/28	100	317	--	319	317	319	0	0	0	0	317	317
3008	498	610	2880	610	--	--	--	--	9	C	03/01-02/28	100	111	--	111	111	111	87	87	0	0	111	111
3011	501	54	1800	54	--	--	--	--	2	C	03/01-02/28	100	16	--	16	16	16	16	16	0	0	16	16
3012	502	229	5000	114	115	--	--	--	6	C	03/01-02/28	100	70	--	81	70	81	59	70	0	0	70	70
3013	503	26	400	--	26	--	--	--	1	C	03/01-02/28	100	13	--	20	13	20	0	7	0	0	13	13
3014	504	992	4000	992	--	--	--	--	25	C	03/01-02/28	100	303	--	303	303	303	303	303	0	0	303	303
3015	505	1122	10320	1059	23	40	--	--	27	C	03/01-02/28	100	321	--	332	321	332	246	257	0	0	321	321
3016	506	81	320	81	--	--	--	--	2	C	03/01-02/28	100	23	--	23	23	23	17	17	0	0	23	23
3017	507	188	3160	188	--	--	--	--	5	C	03/01-02/28	100	64	--	64	64	64	61	61	0	0	64	64
3018	508	320	800	320	--	--	--	--	3	C	03/01-02/28	100	32	--	32	32	32	0	0	0	0	32	32
3020	510	80	3440	80	--	--	--	--	2	C	03/01-02/28	100	23	--	23	23	23	21	21	0	0	23	23
3021	511	40	200	--	40	--	--	--	1	C	03/01-02/28	100	12	--	16	12	16	9	13	0	0	12	12
3022	512	469	800	469	--	--	--	--	7	C	03/01-02/28	100	84	--	84	84	84	0	0	0	0	84	84
3023	513	160	840	160	--	--	--	--	4	C	03/01-02/28	100	46	--	46	46	46	46	46	0	0	46	46
3024	514	683	1889	683	--	--	--	--	12	C	03/01-02/28	100	138	--	138	138	138	108	108	0	0	138	138
3026	516	480	5190	480	--	--	--	--	11	C	03/01-02/28	100	137	--	137	137	137	115	115	0	0	137	137
3027	517	39	863	24	15	--	--	--	1	C	03/01-02/28	100	10	--	12	10	12	7	9	0	0	10	10
3028	518	120	3080	107	13	--	--	--	3	C	03/01-02/28	100	30	--	31	30	31	26	27	0	0	30	30
3029	519	305	4000	217	88	--	--	--	7	C	03/01-02/28	100	77	--	85	77	85	67	75	0	0	77	77
3030	520	161	1840	141	20	--	--	--	3	C	03/01-02/28	100	41	--	43	41	43	18	20	0	0	41	41
3031	521	120	2440	120	--	--	--	--	3	C	03/01-02/28	100	30	--	30	30	30	22	22	0	0	30	30
3033	523	644	3840	644	--	--	--	--	17	C	03/01-02/28	100	214	--	214	214	214	161	161	0	0	214	214
3034	524	880	3360	880	--	--	--	--	16	C	03/01-02/28	100	188	--	188	188	188	137	137	0	0	188	188
3037	527	160	5600	160	--	--	--	--	4	C	03/01-02/28	100	46	--	46	46	46	37	37	0	0	46	46
3039	529	132	3840	49	80	3	--	--	2	C	03/01-02/28	100	42	--	50	42	50	36	44	0	0	42	42
3040	530	80	4720	80	--	--	--	--	2	C	03/01-02/28	100	23	--	23	23	23	17	17	0	0	23	23
3041	531	495	1654	495	--	--	--	--	10	C	03/01-02/28	100	122	--	122	122	122	97	97	0	0	122	122
3042	532	360	2280	356	4	--	--	--	9	C	03/01-02/28	100	103	--	103	103	103	77	77	0	0	103	103
3043	533	400	7000	233	167	--	--	--	11	C	03/01-02/28	100	133	--	148	133	148	116	131	0	0	133	133
3045	535	560	580	557	3	--	--	--	7	C	03/01-02/28	100	80	--	81	80	81	72	73	0	0	80	80
3046	536	280	2270	242	38	--	--	--	6	C	03/01-02/28	100	69	--	72	69	72	64	67	0	0	69	69
3049	539	40	800	40	--	--	--	--	1	C	03/01-02/28	100	16	--	16	16	16	16	16	0	0	16	16
3050	540	189	5720	189	--	--	--	--	5	C	03/01-02/28	100	54	--	54	54	54	54	54	0	0	54	54

YEARLONG AND SEASON AND NUMBER ALLOTMENTS (continued)

RECORD NUMBER	ALLOT NUMBER	PUBLIC ACRES	OTHER ACRES	E+G	FAIR	POOR	UNKNOWN	TP	PUBLIC LAND RANGE CONDITION # & CLS		SEASON	% PUBLIC	CURRENT USE PUBLIC AUMS	CURRENT USE OTHER AUMS	POTENTIAL AUMS	PUBLIC ALTN. A ST	PUBLIC ALTN. A LT	PUBLIC ALTN. B ST	PUBLIC ALTN. B LT	PUBLIC ALTN. C ST	PUBLIC ALTN. C LT	PUBLIC ALTN. D ST	PUBLIC ALTN. D LT
3051	541	160	800	160	--	--	--	--	3	C	03/01-02/28	100	40	--	40	40	40	32	32	0	0	40	40
3052	542	433	320	403	30	--	--	--	10	C	03/01-02/28	100	121	--	123	121	123	110	112	0	0	121	121
3053	543	564	3000	564	--	--	--	--	13	C	03/01-02/28	100	154	--	154	154	154	132	132	0	0	154	154
3055	545	2985	19520	2825	160	--	--	--	53	C	03/01-02/28	100	629	--	643	629	643	260	274	0	0	629	629
3057	547	83	96	83	--	--	--	--	3	C	03/01-02/28	100	41	--	41	41	41	41	41	0	0	41	41
3060	550	80	1840	48	32	--	--	--	2	C	03/01-02/28	100	20	--	23	20	23	17	20	0	0	20	20
3062	552	118	13303	118	--	--	--	--	2	C	03/01-02/28	100	26	--	26	26	26	24	24	0	0	26	26
3063	553	120	1680	120	--	--	--	--	3	C	03/01-02/28	100	35	--	35	35	35	33	33	0	0	35	35
3064	554	120	320	10	110	--	--	--	3	C	03/01-02/28	100	30	--	39	30	39	22	31	0	0	30	30
3065	555	314	313	246	68	--	--	--	7	C	03/01-02/28	100	79	--	85	79	85	59	65	0	0	79	79
3066	556	290	3890	290	--	--	--	--	8	C	03/01-02/28	100	97	--	97	97	97	97	97	0	0	97	97
3070	560	160	1480	160	--	--	--	--	3	C	03/01-02/28	100	40	--	40	40	40	32	32	0	0	40	40
3071	561	40	2980	40	--	--	--	--	1	C	03/01-02/28	100	14	--	14	14	14	12	12	0	0	14	14
3072	562	1003	3520	941	62	--	--	--	27	C	03/01-02/28	100	328	--	334	328	334	276	282	0	0	328	328
3073	563	40	1920	40	--	--	--	--	1	C	03/01-02/28	100	14	--	14	14	14	10	10	0	0	14	14
3074	564	22	1340	22	--	--	--	--	1	C	03/01-02/28	100	9	--	9	9	9	9	9	0	0	9	9
3075	565	40	760	40	--	--	--	--	5	S	03/01-02/28	100	15	--	15	15	15	13	13	0	0	15	15
3076	566	40	1920	40	--	--	--	--	1	C	03/01-02/28	100	12	--	12	12	12	12	12	0	0	12	12
3077	567	40	4440	40	--	--	--	--	1	C	03/01-02/28	100	14	--	14	14	14	12	12	0	0	14	14
3078	568	40	3600	40	--	--	--	--	1	C	03/01-02/28	100	13	--	13	13	13	10	10	0	0	13	13
3079	569	40	2800	40	--	--	--	--	1	C	03/01-02/28	100	13	--	13	13	13	13	13	0	0	13	13
3080	570	37	80	37	--	--	--	--	1	C	03/01-02/28	100	6	--	6	6	6	6	6	0	0	6	6
3081	571	44	--	--	34	10	--	--	1	C	03/01-02/28	100	11	--	16	11	16	0	0	0	0	11	11
3082	572	76	2560	62	14	--	--	--	1	C	03/01-02/28	100	11	--	12	11	12	9	10	0	0	11	11
3083	573	839	200	750	89	--	--	--	10	C	03/01-02/28	100	117	--	166	117	166	117	166	0	0	117	117
6351	021	786	4127	786	--	--	--	--	20	H	05/01-11/30	24	33	107	143	143	143	121	121	0	0	143	143
									77	C	05/01-10/31	24	110	352									
											TOTAL		143	459									
6352	825	120	13728	120	--	--	--	--	2	C	03/01-02/28	100	25	--	25	25	25	25	25	0	0	25	25
6353	826	880	11838	880	--	--	--	--	12	C	03/01-02/28	100	139	--	139	139	139	139	139	0	0	139	139
6355	828	3127	21935	3127	--	--	--	--	32	C	03/01-02/28	100	386	--	386	386	386	321	321	0	0	386	386
6356	829	413	1280	413	--	--	--	--	5	C	03/01-02/28	100	58	--	58	58	58	48	48	0	0	58	58
6358	831	963	3185	963	--	--	--	--	8	C	03/01-02/28	100	97	--	97	97	97	84	84	0	0	97	97
6359	832	201	2130	201	--	--	--	--	5	C	03/01-02/28	100	52	--	52	52	52	52	52	0	0	52	52
6360	833	124	282	124	--	--	--	--	1	C	03/01-02/28	100	8	--	8	8	8	5	5	0	0	8	8
6361	834	5744	57870	5744	--	--	--	--	50	C	05/15-11/15	100	851	--	851	851	851	851	851	0	0	851	851
6362	835	368	25737	368	--	--	--	--	6	C	03/01-02/28	100	72	--	72	72	72	72	72	0	0	72	72
6363	836	3758	4127	3758	--	--	--	--	91	C	04/16-12/15	69	504	224	504	504	504	504	504	0	0	504	504
6364	837	930	19473	930	--	--	--	--	17	C	03/01-02/28	100	207	--	207	207	207	207	207	0	0	207	207
6372	836	403	1044	403	--	--	--	--	37	C	07/16-11/15	47	54	94	54	54	54	54	54	0	0	54	54
	846	3349	1204	5491	--	--	--	--	156	C	07/16-11/15	74	358	266	358	358	358	157	157	0	0	358	358
											TOTAL		412	360									
6373	836	776	--	776	--	--	--	--	18	C	04/16-12/15	70	99	45	99	99	99	99	99	0	0	99	99
	846	2142	1107	--	--	--	--	--	55	C	05/01-11/22	61	229	102	229	229	229	229	229	0	0	229	229
	114	825	126	825	--	--	--	--	6	C	03/01-02/28	100	75	--	75	75	75	75	75	0	0	75	75
											TOTAL		403	147									
6375	848	699	4401	699	--	--	--	--	13	C	03/01-02/28	100	155	--	155	155	155	155	155	0	0	155	155
6377	850	1970	5269	1970	--	--	--	--	5	C	03/01-02/28	100	62	--	176	176	176	27	27	0	0	176	176
									51	C	05/01-10/30	37	114	192									
											TOTAL		176	192									

APPENDIX 2.5: AMP RATING CRITERIA AND EVALUATION/IMPLEMENTATION PRIORITY

This point system was used to determine which existing and proposed AMPs would be evaluated/implemented first. Assigned points do not reflect the importance of the resource or criteria, but do reflect the importance of its evaluation.

COLUMN NO.	FACTOR	POINTS
1	Public Land (Acres) Less than Good	
	0-300	0
	301-600	1
	601-1200	2
	1201-2400	4
	2401+	8
2	Public Land Range Condition	
	0-10% less than good	0
	11-20%	1
	21-30%	2
	31-40%	3
	41-50%	4
	51-60%	5
	61-70%	6
	71-80%	7
	81-90%	8
	91-100%	9

COLUMN NO.	FACTOR	POINTS
3	Percent Public Land (Acres) in Allotment	
	0-25	1
	26-50	2
	51-75	3
	76-100	4
4	Trend	
	Up	0
	Stable	2
	Down	4
5	Wildlife Habitat	
	Winter Range	
	Crucial	2
	General	1
6	Prairie Dog Towns	2
7	Riparian Areas & Woody Draws	2

EXISTING AMPS											PROPOSED AMPS											
RECORD NO.	1	2	3	4	SUB-TOTAL	5	6	7	SUB-TOTAL	GRAND TOTAL	RECORD NO.	1	2	3	4	SUB-TOTAL	5	6	7	SUB-TOTAL	GRAND TOTAL	RECORD NO.	1	2	3	4	SUB-TOTAL	5	6	7	SUB-TOTAL	GRAND TOTAL
2084	1	0	1	0	2	2			2	4	2003	0	1	1		2						2	2810	0	0	3		3				3
2549	1	0	1	2	4					4	2098	1	3	1		5						5	2815	1	0	3		4				4
2550	2	1	2	-	5					5	2109	0	0	1		1	2			2		3*	2816	1	0	3		4		2	2	6
2568	2	0	2	0	4	2			2	6	2131	0	2	1		3		2		2		5	2817	1	1	2		4				4
2727	0	0	4	2	6	2			2	8	2144	8	0	1		9	2			2		11	2818	0	0	3		3	2	2	3	7
2728	2	1	3	2	7	2			2	9	2217	2	8	1		11						11	2819	1	1	2		4				4
2737	0	0	3	0	3	2			2	5	2219	1	2	2		5						5	2822	0	1	3		4				4
2738	1	1	2	2	6	2			2	8	2223	2	1	1		4	1		2	3		7	2823	0	0	2		2		2	2	4
2745	0	0	2	2	4					4	2225	1	4	1		7	1			1		8	2827	1	2	3		6	2		2	8
2750	2	0	3	4	9	1			1	10	2239	1	0	2		3	2			2		5	2848	0	0	3		3				3
2752	0	0	2	2	4	2			2	6*	2257	2	1	1		4						4	2851	0	0	2		2				2*
2755	1	0	3	2	6					6	2292	1	0	1		2	2			2		4	2911	4	1	1		6	1		1	7
2762	0	0	4	2	6					6*	2351	2	4	2		8						8	2932	0	0	2		2				2*
2763	0	0	2	2	4	2			2	6*	2377	2	0	1		3	1			1		4	2941	0	0	1		1	2		2	3
2772	2	0	2	0	4					4	2514	4	4	1		9	1			1		10	2957	1	2	1		4				4
2773	0	0	3	2	5	1			1	6*	2547	8	2	2		12		2		2		14	2958	0	0	3		3	2		2	5
2774	0	0	3	2	5	1			1	6	2551	2	1	2		5	1			1		6	2994	0	0	2		2	1		1	2*
2786	1	1	3	2	7					7	2555	4	4	2		10						10	2995	1	1	2		4				4
2792	2	1	2	2	7					7	2558	8	1	2		11	1	2		3		14	2999	1	1	2		4				4
2793	0	0	3	2	5	1			1	6*	2590	2	8	2		12						12	3004	0	0	1		1				1
2803	2	0	4	0	6					6	2591	1	3	2		6	1			1		7	3005	0	0	2		2	2		2	4*
2807	2	5	3	4	14					14	2624	2	5	2		9	1			1		10	3006	0	0	2		2				2
2824	0	0	3	2	5					5	2626	4	9	1		14						14	3010	0	0	3		3				3*
2828	0	0	4	2	6					6*	2651	2	5	2		9						9	3025	0	0	1		1				1*
2829	2	4	2	0	8					8	2672	1	2	2		5						5	3032	0	0	2		2	1		1	3
2831	0	0	3	2	5	2			2	7	2676	2	1	2		5						5	3054	0	0	1		1				1*
2838	0	0	3	0	3					3*	2682	2	2	3		8						8	3056	0	0	1		1	2		2	3*
2861	2	1	3	4	10	2			2	12	2691	0	0	2		2			2	2		4*	3058	0	0	2		2	2		2	4
2873	1	0	3	2	6					6	2744	0	0	3		3	1			1		4*	3059	0	0	3		3				3
2946	0	0	2	2	4					4	2748	0	0	2		2						2*	6374	0	0	3		3	2		2	5
											2802	0	0	3		3			2	2		5	6376	0	0	3		3	2		2	5*
											2804	2	0	2		4						4										

* No public land identified as less than good

APPENDIX 2.6: MONTANA BLM PRAIRIE DOG POLICY AS OF APRIL 1980

The management of prairie dog habitats on public lands in Montana, administered by the Bureau of Land Management (BLM), is a controversial issue because of the conflicting interests of a concerned public. More than 100 public comments were received in response to a draft Habitat Management Plan for the Prairie Dog Ecosystem distributed by BLM. This document was widely reviewed by citizens, private organizations and public agencies throughout the United States. Comments ranged from those favoring total preservation of prairie dogs to those advocating large scale population reductions.

BLM policy for managing prairie dog habitat was formulated after careful review of all public comments received, and consideration of applicable Federal and state laws and regulations. This policy is intended to be responsive to those comments and to BLM's legal mandates.

The Bureau recognizes the authority of the State of Montana for management of resident wildlife species, including prairie dogs. Any population management on public land will be accomplished in cooperation with the appropriate state agencies.

All prairie dog towns on public land will be inventoried and examined for presence of associated wildlife species including threatened or endangered species. The Bureau will cooperate where feasible with other agencies, universities and private groups to accomplish inventories and ecological studies.

The BLM recognizes the prairie dog ecosystem as an integral part of the prairie environment and its perpetuation should be consistent with multiple use management of public lands. The following policies shall apply in this regard:

1. Selected prairie dog towns will be maintained at a determined level to support a viable population of prairie dogs for public use. Public uses include nature study, scientific research, photography, educational study and sport hunting.

2. Selected prairie dog towns will be maintained at a determined level to provide habitats for associated wildlife species. Prairie dog towns are used by more than 20 wildlife species of which 6 have been designated as species of special concern by Montana Department of Fish, Wildlife and Parks.

3. Selected prairie dog towns will be maintained at a determined level to provide habitat for species designated as threatened or endangered by Federal and state laws. Currently, the black-footed ferret is the only endangered species known to be associated with prairie dog towns, which are primary habitat for this mammmal. Prairie dog towns on public lands will be maintained to support at least one wild self-sustaining population of ferrets in Montana as prescribed by the Fish and Wildlife Service's Black-Footed Ferret Recovery Plan.

Although some prairie dog towns may be managed primarily for wildlife and recreational values, others not selected for these purposes will be subject to multiple use management. Where prairie dogs are reported to damage public and adjoining private rangelands the following policy shall apply:

1. Where it has been documented through field investigation that prairie dogs cause unacceptable damage to public resources, such as soil loss or destruction of vegetation, a variety of land treatments including prairie dog control will be considered for rehabilitating rangelands. Other treatments may include such practices as watershed improvements and manipulation of livestock grazing. Prairie dog control will be carried out by appropriate state and Federal agencies using techniques recommended by them and approved by BLM. Sport hunting of prairie dogs, as permitted under state law, is recognized as a legitimate recreational use of public lands; hunters may be directed to towns approved for control.

2. Before control plans for any prairie dog towns can be approved by BLM, each town must be intensively inventoried for threatened and endangered species. If such species are present, any proposal for control must clearly demonstrate that prairie dog control will not jeopardize the continued existence of the species or destroy or adversely modify its habitat.

3. All approved control plans will be fully coordinted with appropriate state and Federal agencies.

The BLM recognizes implementing this policy will require close coordination with Federal and state agencies and private landowners. These include, but are not limited to, Montana Department of Fish, Wildlife and Parks, Montana Department of Livestock, United States Fish and Wildlife Service, livestock operators on public lands, and private landowners whose property adjoins public land.

Source: BLM, 1980.

APPENDIX 2.7: ALTERNATIVE IMPLEMENTATION COSTS

The cost of implementing each alternative is shown below. Cost items included are: construction (labor and materials), overhead (project implementation, design, administration), and cultural clearance.

	ALTERNATIVE			
	A	B	C	D
CONSTRUCTION AND OVERHEAD			*	
Fences @ $2300/mile			16,944,100	
Management	529,000	529,000	0	0
Enclosure	Unknown	3,523,600	0	0
Water Sources				
AMPs 1/section @ $3800 ea.	1,748,000	1,748,000	0	0
NonAMPs 1/2 sections @ $3800 ea.	1,934,200	1,934,200	0	0
Mechanical Treatment				
127,929 Acres @ $28/acre	3,582,012	3,582,012	0	0
Noxious Weed Control				
4500 acres @ $850/acre**	3,825,000	3,825,000	Unknown	0
Prairie Dog Control				
560 acres @ $5/acre	2,800	0	0	0
TOTAL	11,621,012	15,141,812	16 944,100	0
CULTURAL CLEARANCE				
Water Sources $55 each	53,295	53,295	0	0
Mechanical Treatment $2.20/acre	281,444	281,444	0	0
TOTAL	334,739	334,739	0	0
GRAND TOTAL	11,955,751	15,476,551	16,944,100	0

* Cost to adjoining landowner to fence off the public land would be $16,944,100 = 1,178,777 acres ÷ 640 acres x 4 = 7367 miles of fence at $2300 per mile.

** Control requires 5 years x $170/acre = $850/acre total treatment cost.

APPENDIX 2.8A: POSSIBLE MECHANICAL TREATMENTS BY SOIL SERIES**

Soil Subgroup * and Selected Soil Names	Plowing and Seeding LCC III, IV	Ripping/Chiseling LCC IV, V, VI	Contour Furrowing and Scalping	Waterspreaders (less than 4 % slopes)	Erosion Susceptability
1) Clayey, loamy and sandy soils on flood plains, and low terraces. Series: Absher, Alona Banks, Benz, Bowdoin, Cherry, Creed, Dooley, Glendive, Hanly, Harlem, Havre, McRae, Trembles	Banks, Cherry, Creed, Dooley, Glendive, Havre, McRae, Lonna, Trembles	Creed, Harlem, Havre	Absher, Creed, Gerdrum	Cherry, Creed, Dooley, Gerdrum, Havre, Lonna, McRae, Trembles	Moderate
2) Loamy and sandy soils on nearly level to strongly roling (2-15% slopes) fans, benches and terraces. Series: Beaverton, Farland, Farnuf, Lihen, Marmarth, Morton, Parshall, Reeder, Regent, Savage Shambo, Tally, Turner	Farland, Farnuf, Marmarth, Parshall, Reeder, Regent, Shambo, Tally, Turner			Farland, Farnuf, Marmarth, Morton, Reeder Regent, Savage Shambo, Tally	Low
3) Loamy and sandy strongly sloping to steep (8-45% slopes) soils on sedimentary bedrock plains and hills. Series: Barkof, Bitton, Blanchard, Brandenburg, Cabba, Cambert, Chamma, Dast, Dimyaw, Flasher, Fleak, Lambert, Lehr, Lisk, Vebar, Wabek, Yetull, Zahill	Chama, Kremlin, Lambert, Lehr, Cambert,	Lehr,		Chama, Kremlin Lambert, Lehr	High
4) Clayey, loamy and sandy soils on nearly level to strongly sloping (0-15% slopes) sedimentary bedrock plains. Series: Adger, Arnegard, Barvon, Brandenburg, Cabba, Cambert, Chama, Dast, Dimyaw, Farland, Farnuf, Flasher, Fleak, Floweree, Grail, Lambert, Lehr, Lisk, Marmarth, Morton, Norbert Parshall, Reeder, Regent, Savage, Searing, Shambo, Tally, Vebar, Wabek, Zahill	Farland, Farnuf, Floweree, Parshall, Reeder, Savage, Tally, Arnegard, Grail, Lambert, Lehr, Marmarth, Morton, Regent, Searing, Shambo, Vebar	Lehr, Vebar	Reeder, Regent, Savage, Marmarth, Morton	Arnegard, Chama, Farland Farnuf, Floweree, Grail, Lambert, Marmarth, Morton, Parshall, Searing, Shambo Savage, Tally	Low
5) Loamy soils on undulating to strongly rolling (2-15% slopes) glacial till plains. Series: Bowbells, Dooley, Marmarth, Morton, Reeder, Regent, Savage, Telstad, Vida, Williams	Bowbells, Creed, Marmarth, Morton, Regent, Savage, Tealette, Telstad, Williams		Creed Tealette	Bowbells, Creed, Dooley, Marmarth, Morton, Regent Savage, Williams	Low

Soil Subgroup * and Selected Soil Names	Plowing and Seeding LCC III, IV	Ripping/Chiseling LCC IV, V, VI	Contour Furrowing and Scalping	Waterspreaders (less than 4% slopes)	Erosion Susceptability
6) Loamy soils on strongly rolling to steep (8-45% slopes) dissected glacial till plains. Series: Cabba, Lambert, Norbert, Sunburst, Tinsley, Williams, Zahill	Lambert, Williams			Lambert, Williams	High
7) Clayey, loamy and sandy soils on nearly level to steep (0-45% slopes) fans, benches and terraces. Series: Attewan, Beaverton, Chanta, Chinook, Degrand, Ethridge, Evanston, Gerdrum, Kremlin, Lihen, Yamac	Attewan, Chinook, Degrand, Ethridge, Evanston, Kremlin, Yamac		Gerdrum, Ethridge	Attewan, Chinook, Degrand, Ethridge, Evanston, Kremlin, Yamac	Moderate
8) Clayey and sandy soils on strongly sloping to steep (8-45% slopes) dissected sedimentary bedrock plains and hills. Series: Blackhall, Cabbart, Neldore, Rentsac, Twilight, Yawdim					High
9) Clayey and loamy soils on nearly level to strongly sloping (0-15% slopes) sedimentary bedrock plains. Series: Bonfri, Chinook, Ethridge, Evanston, Forelle, Pinelli	Bonfri, Chinook, Ethridge, Evanston, Forelle, Pinelli,	Ethridge, Evanston, Forelle Pinelli	Ethridge, Evanston, Pinelli	Bonfri, Chinook, Evanston Forelle, Pinelli	Low
10) Clayey and loamy soils on nearly level to hilly (0-25% slopes) glacial till plains. Series: Lambert, Vida, Williams, Zahill	Vida, Williams			Vida, Williams	Moderate

Soil Subgroup * and Selected Soil Names	Plowing and Seeding LCC III, IV	Ripping/Chiseling LCC IV, V, VI	Contour Furrowing and Scalping	Waterspreaders (less than 4% slopes)	Erosion Susceptability
11) Clayey and loamy soils on nearly level to steep (0-45% slopes) fans, benches, and terraces. Series: Attewan, Busby, Degrand, Gerdrum, Pinelli, Weingart, Yamac	Attewan, Busby, Degrand, Gerdrum, Yamac	Pinelli	Gerdrum, Weingart	Attewan, Creed Degrand, Gerdrum, Pinelli Yamac	High
12) Clayey, loamy and sandy soils on strongly sloping to steep (8-45% slopes) dissected plains and hills. Series: Abor, Archin, Armells, Birney, Blackhall, Blanchard, Busby, Cabbart, Cambeth, Chinook, Cooers, Delpoint, Kirby, Kobar, Kremlin, Lambeth, Neldore, Nihill, Parchin, Pierre, Rentsac, Yamac, Yawdim, Yetull	Busby, Cambeth, Chinook, Delpoint, Kobar, Kremlin, Lambeth, Lonna			Cambeth, Chinook, Kobar, Kremlin, Lambeth, Lonna	High
13) Clayey, loamy and sandy soils on nearly level to moderately steep (0-25% slopes) sedimentary bedrock plains. Series: Absher, Alona, Archin, Armells, Arnegard, Assiniboine, Birney, Bitton, Blackhall, Bonfri, Busby, Cabbart, Cambeth Chinook, Cooers, Creed, Delpoint, Ethridge, Evanston, Floweree, Forelle, Gerdrum, Kirby, Kobar, Kremlin, Lambeth, Marias, Marmarth, Marvan, McRae, Parchin, Tealer, Vebar, Yamac	Assiniboine, Busby, Chinook, Creed, Ethridge, Evanston, Floweree, Gerdrum, Lambeth, Yamac		Absher, Creed, Gerdrum, Tealer	Arnegard, Assiniboine, Bonfri, Cambeth, Chinook, Creed, Evanston, Floweree, Gerdrum, Kobar Kremlin, Marias Marmarth, McRae, Yamac	Moderate

Soil Subgroup * and Selected Soil Names	Plowing and Seeding LCC III, IV	Ripping/Chiseling LCC IV, V, VI	Contour Furrowing and Scalping	Waterspreaders (less than 4% slopes)	Erosion Susceptability
14) Clayey soils on strongly sloping to steep (8-45% slopes) dissected shale plains. Series: Abor, Bascovy, Bickerdyke, Boettcher, Dilts, Julin, Kobar, Neldore, Yawdim	Kobar, Bascovy	Bascovy, Bickerdyke, Boettcher		Kobar	High
15) Clayey, silty and sandy soils on highly dissected (25-70% slopes) river breaks and badlands. Series: Abor, Badlands (misc. land type), Blackhall, Cabbart, Neldore, Yawdim, shales and sandstone rock outcrops					High

* See legend and soils map in Map Supplement

** Soil series list will be updated as more data become available. Treatments will be made after on site investigations during activity plans.

APPENDIX 2.8B: SOIL RESPONSE TO RANGE TREATMENTS

Soil Subgroup * and Selected Soil Names	A. Mechanical Treatments needed in combination with grazing treatments (series)	B. Respond to Grazing Treatments improve to next condition class in 15 years (series)	C. Unsulted for Treatments, unresponsive to grazing management
1) Clayey, loamy and sandy soils on flood plains, and low terraces. Series are Absher, Alona, Banks, Benz, Bowdoin, Cherry, Creed, Dooley, Glendive, Hanly, Harlem, Havre, McRae, Trembles, Tealer	Absher, Benz, Cherry, Dooley, Gerdrum, Havre, McRae, Trembles Tealer	Alona, Banks, Bowdoin, Glendive, Hanly, Harlem, Lollie, McKenzie, Trembles	
2) Loamy and sandy soils on nearly level to strongly rolling (2-15% slopes) fans, benches and terraces. Series are Beaverton, Farland, Farnuf, Lihen, Marmarth, Morton, Parshall, Reeder, Regent, Savage, Shambo, Tally, Turner	Farland, Farnuf, Marmarth, Morton, Parshall, Reeder, Turner, Shambo, Tally	Lihen, Regent, Savage	Beaverton, Wabek
3)Loamy and sandy; strongly sloping To steep (8-45% slopes) soils on sedimentary bedrock plains and hills. Series: Barkof, Bitton, Blanchard Brandenberg, Cabba, Cambert, Chama, Dast, Dimyaw, Flasher, Fleak, Lambert, Lehr, Lisk, Yebar, Wabek, Yetull	Chama, Kremlin, Lambert, Lehr	Blanchard, Cambert, Dast, Flasker, Fleak, Lisk, Vebar, Zahill, Yetull	Barkof, Bitton, Brandenburg, Cabba, Dimyaw, Wabek
4) Clayey, loamy and sandy soils, on nearly level to strongly sloping (0-15% slopes), sedimentary bedrock plains. Series: Adger, Arnegard, Barvon, Brandenberg, Cabba, Cambert, Chama, Dast, Dimyaw, Farland, Farnuf, Flasher, Fleak, Floweree, Grail, Lambert, Lehr, Lisk, Marmarth, Morton, Norbert, Parshall Reeder, Regent, Savage, Searing, Shambo, Tally, Vebar, Wabek, Zahill	Adger, Arnegard, Chama, Farland Farnuf, Floweree, Grail, Lambert, Lehr, Macar, Marmarth, Morton, Reeder, Regent, Savage, Searing, Tally, Vebar	Barvon, Cambert, Dast, Flasher, Fleak, Norbert, Zahill, Cabba, Dimyaw, Norbert, Parshall	Brandenburg, Wabek

Soil Subgroup * and Selected Soil Names	A. Mechanical Treatments needed in combination with grazing treatments (series)	B. Respond to Grazing Treatments Improve to next condition class in 15 years (series)	C. Unsuited for Treatments, unresponsive to grazing management
5) Loamy soils, on undulating to strongly rolling (2-15% slopes) glacial till plains. Series: Bowbells, Dooley, Marmarth, Morton, Reeder, Regent, Savage, Teistad, Vida, Williams	Bowbells, Creed, Dooley, Marmarth, Morton, Regent, Savage, Tealette, Telstad, Williams	Vida, Zahill	
6) loamy soils on strongly rolling to steep (8-45% slopes) dissected glacial till plains. Series: Cabba, Lambert, Norbert, Sunburst, Tinsley, Wililams, Zahill	Lambert, Williams	Sunburst, Zahill, Cabba, Norbert	Tinsley
7) Clayey, loamy and sandy soils on nearly level to steep (0-45% slopes) fans, benches, and terraces. Series: Attewan, Beaverton, Chanta, Chinook, Degrand, Ethridge, Evanston, Kremlin, Lihen, Twilight, Yamac	Attewan, Degrand, Ethridge, Evanston, Kremlin, Yamac	Lihen, Twilight, Chinook	Beaverton
8) Clayey and sandy soils on strongly sloping to steep (8-45% slopes) dissected sedimentary bedrock plains and hills. Series: Cabbart, Blackhall, Neldore, Rentsac, Twilight, Yawdim		Neldore, Riedel, Twilight, Cabbart	Blackhall, Rentsac

Soil Subgroup * and Selected Soil Names	A. Mechanical Treatments needed in combination with grazing treatments (series)	B. Respond to Grazing Treatments improve to next condition class in 15 years (series)	C. Unsulted for Treatments, or unresponsive to grazing management
9) Clayey and loamy soils on nearly level to strongly sloping (0-15% slopes) sedimentary bedrock plains. Series: Bonfri, Chinook, Ethridge Evanston, Forelle, Pinelli	Bonfri, Ethridge, Evanston, Forelle, Pinelli	Chinook	
10) Clayey and loamy soils on nearly level to hilly (0-25% slopes) glacial till plains. Series: Theony, Vida, Williams, Zahl, Zahlll	Theony	Williams, Vida, Zahl	
11) Clayey and loamy soils on nearly level to steep (0-45% slopes) fans benches and terraces. Series: Busby, Attewan, Cabbart, Degrand, Delpoint Delpoint, Gerdrum, Pinelll, Weingart, Yamac	Attewan, Creed, Degrand, Yamac, Pinelll, Weingart	Busby, Cabbart, Delpoint, Yawdim	
12) Clayey, loamy and sandy soils on nearly level to steep (8-45% slopes) dissected sedimentary bedrock plains and Series: Abor, Archin, Armells, Birney, Black-hall, Blanchard, Busby, Cabbart, Cambeth, Chinook, Cooers, Creed, Delpoint, Gerdrum, Kirby, Kobar, Kremlin, Lambeth, Lisam, Nobe, Neldore, Nihlll, Parchin, Vaeda, Vanda, Yawdim, Yetull	Cambeth, Delpoint, Gerdrum, Kobar, Kremlin, Lambeth, Lonna, Marias, Archin, Parchin	Armells, Birney, Busby, Blanchard, Chinook, Delpoint, Lisam, Neldore, Riedel, Twilight Yawdim, Yetull	Blackhall, Cabbart, Nobe, Vaeda, Vanda, Kirby, Nihlll Rentsac

Soil Subgroup * and Selected Soil Names	A. Mechanical Treatments needed in combination with grazing treatments (series)	B. Respond to Grazing Treatments improve to next condition class in 15 years (series)	C. Unsuited for Treatments, unresponsive to grazing management
13) Clayey, loamy and sandy soils on nearly level to moderately steep (0-25% slopes) sedimentary bedrock plains. Series: Absher, Alona, Archin, Armells, Arnegard Assiniboine, Birney, Bitton, Blackhall, Bonfri Busby, Cabbart, Cambeth, Chinook, Cooers, Creed, Delpoint, Ethridge, Evanston, Floweree, Forelle, Gerdrum, Kirby, Kobar, Kremlin, Lambeth, Marias, Marmarth, Marvan, McRae, Nobe, Parchin, Tealer, Valda, Vanda, Yamac	Absher, Archin, Arnegard, Assiniboine, Busby, Bitton, Bonfri, Cambeth, Chinook, Creed, Cooers, Delpoint, Ethridge, Evanston, Floweree, Forelle, Gerdrum, Kremlin, Lambeth, Lonna, Marias, Marmarth, McRae, Parchin, Vebar, Yamac	Alona, Armells, Birney, Bitton, Cabbart, Delpoint, Kobar, Marias, Marvan, Riedel, Thebo, Twilight	Blackhall, Kirby, Nobe, Vaeda, Vanda
14) Clayey soils on nearly level to steep (8-45% slopes) dissected shale plains. Series: Abor, Bascovy,Bickerdyke, Boettcher, Diits, Juiin, Kobar, Nobe, Neldore, Vaeda, Vanda, Yawdim	Absher, Creed, Gerdrum	Abor, Bascovy, Bickerdyke Diits, Dimyaw, Gomar, Julin, Kobar, Lisam, Midway, Neldore, Yawdim	Boettcher, Vaeda, Nobe, Vanda
15) Clayey, silty and sandy soils on highly dissected river breaks and badlands. Series: Abor, Badlands (misc. land type), Blackhall, Cabbart, Neldore, Yawdim, shales and sandstones rock outcrops			

* See legend for soils map in Map Supplement

**Soil series list will be updated as more data becomes available. Treatments will be made after on site investigations during activity plans.

Soil Subgroup * and Selected Soil Names	Percent of Public Land (1)	Vegetation Type (2)	Key Species	Increasers	Response to Grazing Management	Suitability for Mechanical Treatments	Other Suitable Land Treatments	Other
1) Clayey, loamy and sandy soils on nearly level to strongly sloping (0-15% slopes) flood plains, low terraces. Series: Absher, Alona, Banks, Benz, Bowdoin, Cherry, Creed, Dooley, Dimmick, Glendive, Hanly, Harlem, Havre, Haverlon	6.4% (109,000)	grasslands and deciduous woodlands	western and thickspike wheatgrass, green needle-grass, willows, cottonwood	wildrose, snowberry, cactus, bluegrass	Responds quickly, livestock congregate here	Suited on slopes <12% on selected series	Waterspreaders on slopes <4%, prescribed burning, seeding, fertilization	Benz soils is strongly alkaline. Bowdoin has a heavy clay surface texture.
2) Loamy and sandy soils on nearly level to strongly rolling (2-15% slopes) dissected glacial till plains. Series: Cabba, Lambert, Norbert, Sunburst, Tinsley, Williams, Zahl	1.5% (26,000)	grassland	western wheatgrass, green needlegrass	blue grama, prairie Junegrass	Moderate to slow	Suited on slopes <12% on selected series	Prescribed burning, fertilization, seeding	Wind erosion on unprotected soils
3) Loamy and sandy, strong sloping (8-45% slopes) soils on sedimentary bedrock plains and hills. Series: Barkof, Bitton, Blanchard, Brandenburg, Cabba, Cambert, Dast, Dimyaw, Flasher, Fleak, Lambert, Lehr, Lisk, Vebar, Wabek, Yetull	9.3% (159,000)	grassland	western wheatgrass, green needlegrass	yucca, blue grama, red three awn, needle-and-thread	Moderate	Well suited on slopes <12% on selected series	Prescribed burning, fertilization	Shallow soils and steep slopes will limit activities
4) Clayey, loamy and sandy soils, on nearly level to strongly sloping (0-15% slopes) sedimentary bedrock plains. Series: Adger, Arnegard, Barvon, Brandenburg, Cabba, Cambert, Chama, Dast, Dimyaw, Farland, Farnuf, Flasher, Fleak, Floweree, Grail, Lambert, Lehr, Lisk, Marmarth, Morton, Norbert, Parshall, Reeder, Regent, Savage, Searing, Shambo, Tally, Vebar, Wabek, Zahill	10.5% (180,000)	grassland and grassland sagebrush	western wheatgrass, needle-and-thread	needle-and-thread, blue grama, club-moss, fringe sagewort, cactus	Slow due to clubmoss and and blue grama	Well suited on slopes <12% on selected series	Prescribed burning, waterspreaders on slopes <4%, seeding, fertilization	Shallow soils will limit activities
5) Loamy soils, undulating to strongly rolling (2-15% slopes) on glacial till plains. Series: Bowbells, Dooley, Marmarth, Morton, Reeder, Regent, Savage, Telstad, Vida, Williams	5.9% (101,000)	grassland	western wheatgrass, green needlegrass	needle-and-thread grass blue grama, fringe sage-wort, cactus	Slow due to clubmoss and blue grama grass	Moderately suited on slopes <8% selected series	Fertilization, prescribed burning, seeding, waterspreaders <4% slopes	Local areas have gravels and stones which influence suitability for mechanical treatment
6) Loamy soils on strongly rolling to steep (*8-45% slopes) on dissected glacial till plains. Series: Cabba, Lambert, Norbert, Sunburst, Tinsley, Williams, Zahill	0.5% (9,000)	grassland	green needlegrass, western and thickspike wheatgrass	needle-and-thread grass blue grama, clubmoss, fringe sage-wort, needle-and-thread grass	Slow due to clubmoss and and blue grama	Well suited on slopes <12% on selected series	Fertilization prescribed burning	Local areas have gravels and stones or are shallow which may influence suitability for mechanical treatment
7) Clayey, loamy and sandy soils on nearly level to steep (0-45% slopes) on fans, benches and terraces. Series: Absher, Attewan, Beaverton, Busby, Chanta, Chinook, Degrand, Ethridge, Evanston, Kremlin, Lihen, Marmarth, McRae, Morton, Parshall, Reeder, Regent Rhoades, Sappington, Savage, Searing, Tally, Turner, Vebar, Wabek, Yamac	1.8% (31,000)	grassland	western and thickspike wheatgrass	big sage-brush, fringe sagewort, needle-and-thread grass	Moderate to slow	Well suited on slopes <8% on selected series	Prescribed burning, fertilization, waterspreaders seeding	Wind, erosion on unprotected soils
8) Clayey and sandy soils on strongly sloping to steep (*8 -45% slopes) soils on dissected sedimentary bedrock plains and hills. Series: Blackhall, Midway, Neldore, Rentsac, Travessilla, Twilight Yawdim	0.4% (7,000)	grassland	bluebunch wheatgrass, needle-and-thread grass	blue grama, yucca	Moderate	Poorly suited		Shallow soils will limit activities

Soil Subgroup * and Soil Names	Percent of Public Land (1)	Vegetation Type (2)	Key Species	Increasers	Response to Grazing Management	Suitability for (3) Mechanical Treatments	Other Suitable Land Treatments	Other
9) Clayey and loamy soils on nearly level to strongly sloping (0-15% slopes) on sedimentary bedrock plains. Series: Bonfri, Chinook, Ethridge, Evanston, Forelle, Marmarth, Morton, Pinelli, Reeder, Regent, Renohill, Sappington, Terry, Travessilla	0.5% (9,000)	grassland	needle-and-thread grass, thickspike and western wheatgrass	Sandberg bluegrass, big sagebrush, ponderosa pine	Slow to moderate	Well suited on slopes <8% on selected series	Prescribed burning, fertilization, seeding, waterspreaders	Wind erosion on unprotected soils
10) Clayey and loamy soils on nearly level to hilly (0-25% slopes) on glacial till plains. Series: Briggsdale Telstad, Theony, Vida, Williams, Zahl	0.9% (15,000)	grassland	western wheatgrass	blue grama, needle-and-thread grass clubmoss, fringe sagewort	Slow due to clubmoss and blue grama	Well suited on slopes <8% on selected series	Prescribed burning, fertilization, seeding	Local areas have surface stones which influence suitability for mechanical treatment
11) Clayey and loamy soils on nearly level to steep (0-45% slopes) fans, benches and terraces. Series: Absher, Busby, Attewan, Creed, Oegrand, Gerdrum McRae, Parchin, Pinelli, Renohill, Rominell, Wanetta, Yamac	1.0% (17,000)	grassland	western and thickspike wheatgrass	big sagebrush, fringe sagewort, needle-and-thread grass	Moderate to rapid	Well suited on slopes <8% on selected series	Prescribed burning, fertilization, seeding, waterspreaders	Wind erosion on unprotected soils
12) Clayey, loamy and sandy soils on strongly sloping to steep (8-45% slopes) on dissected sedimentary bedrock plains and hills. Series: Absher, Along, Archin, Armells, Badlands (misc. land type), Birney, Blackhall, Blanchard, Busby, Cabbart, Cambeth, Chinook, Cooers, Creed, Oelpoint, Gerdrum, Kirby, Kobar, Kremlin, Lambeth Lisam, Marias, Marvan, Midway, Neldore, Nihill, Parchin, Pendroy, Pierre, Rentsac, Travessilla, Yawdim, Yetull	44.3% (758,000)	grassland or woodland and grassland	bluebunch and western wheatgrass, needle-and-thread, little bluestem	ponderosa pine, blue grama, yucca juniper	Slow to moderate	Well suited on <8% slopes on selected series	Prescribed burning, fertilization	Wind erosion on unprotected areas. Shallow soils and steep slopes will limit activities.
13) Clayey, loamy and sandy soils on nearly level to moderately steep (0-25% slopes) on sedimentary bedrock plains. Series: Absher, Alona, Archin, Armells, Arnegard, Assiniboine, Birney, Bitton, Blackhall, Bonfri, Busby, Cabbart, Cambeth, Chinook, Cooers, Creed, Delpoint, Ethridge, Evanston, Floweree, Forelle, Gerdrum, Kirby, Kobar, Kremlin Lambeth, Marias, Marmarth, Marvan, McRae, Parchin, Renohill, Terry, Thebo, Vebar, Wanetta, Yamac	10% (171,000)	grassland	western wheatgrass, little bluestem	bluegrass, ponderosa pine, annual bromes, blue grama	Slow to rapid	Well suited on slopes <12% on selected series	Prescribed burning, fertilization,	Wind erosion on unprotected soils Shallow soils and steep slopes will limit activities
14) Clayey soils on strongly sloping to steep (8-45% slopes) on dissected shale plains. Series: Abor, Absher, Bascovy, Bickerdyke, Boettcher, Creed, Oilts, Gerdrum, Gomar, Julin, Kobar, Lisam, Midway, Neldore, Olmyaw, Yawdim	3.5% (58,000)	ponderosa pine/ grassland	western and thickspike wheatgrass, green needlegrass, prairie sandreed, little bluestem	ponderosa pine, creeping juniper, big sagebrush	Slow to moderate	Poorly suited due to slope	Prescribed burning, fertilization	Wind erosion on unprotected soils Shallow soils and steep slopes will limit activities
15) Clayey, loamy and sandy soils on highly dissected river breaks and badlands. Series: Badlands (misc. land type), Cabbart, Lisam, Vaeda, Yawdim, shale and sandstone rock outcrops	4.1% (70,000)	juniper/ grassland or limber pine/ grassland	bluebunch and western wheatgrass	blue grama, yucca, annuals, weedy forbs, broom snakeweed	Very slow	Not suited due to slope		Shallow soils and steep slopes will limit activities

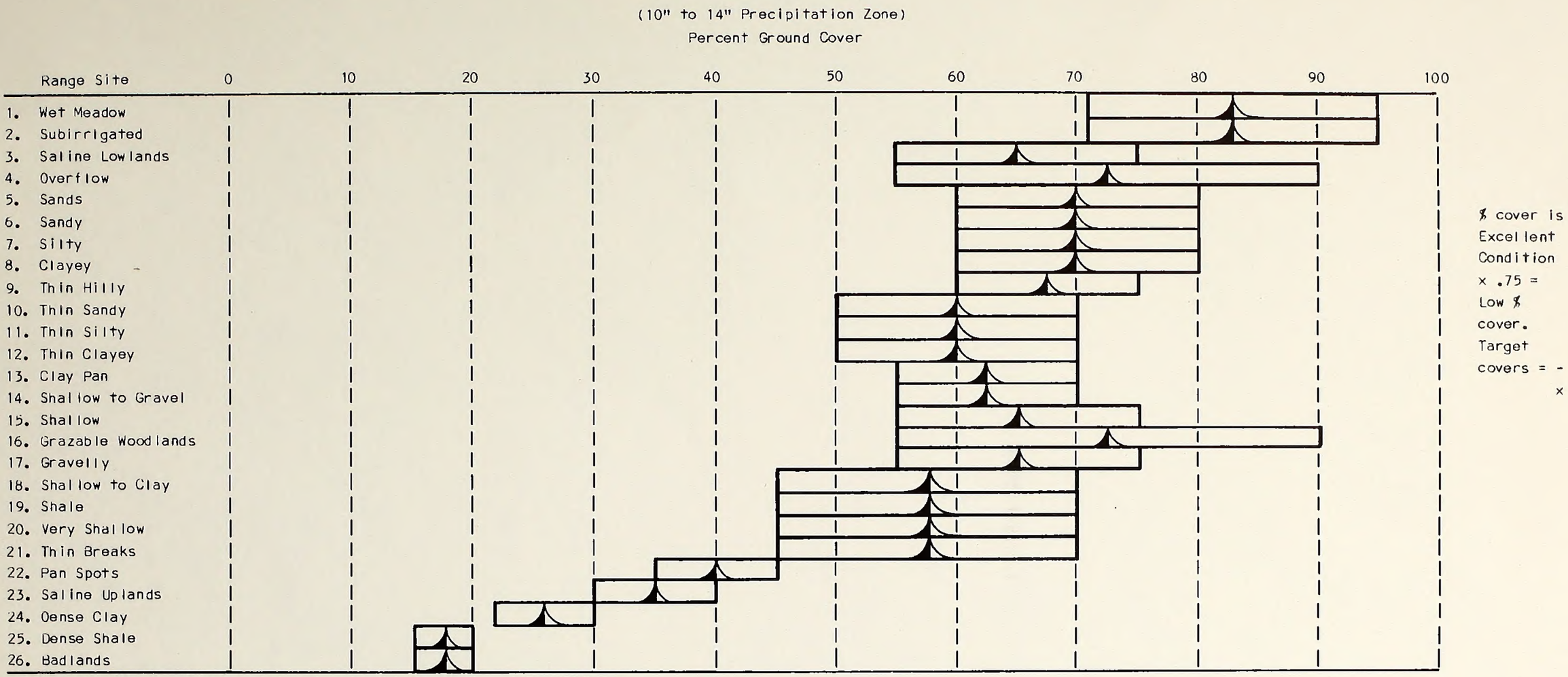
(1) Assume soils are randomly distributed regardless of ownership.

(2) Grasslands are dominated by short and midgrass species.

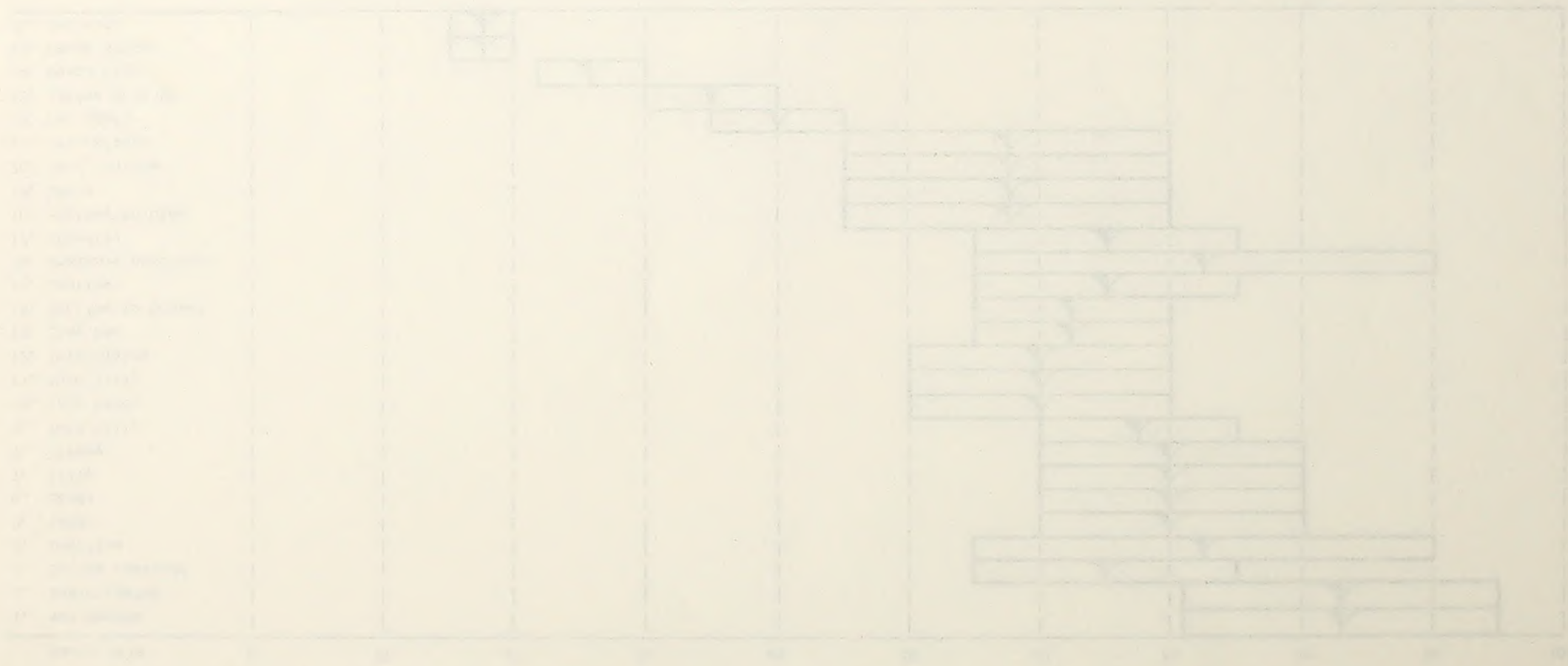
(3) Mechanical treatments (contour furrowing, scalping, chiseling) subject to on-site investigation of soils.

* See legend for soils map in Map Supplement

APPENDIX 3.2: SOIL TARGET COVERS ON RANGE SITES



*SCS Soil/Range Site are arranged into most productive to least productive.



APPENDIX 3.3: BIG DRY SOIL SERIES BY SCS RANGE SITES

	RANGE SITE	EXAMPLES OF SOIL SERIES
1.	Wet Meadow	Lallie, Lohler
2.	Subirrigated	Aeric Fluvaguents, Colvin, Dimmick
3.	Saline Lowlands	Alona, Benz, Cherry (saline phase), Gomar, Ustic Torriorthents
4.	Overflow	Arnegard, Adger, Cherry, Glendive, Grail, Harlem, Havre, Havrelon, Hanly, Lohler, Lohmiller, McKenzie, Rivra, Torrifluvents, Trembles
5.	Sands	Blanchard, Lihen, Hanly, Yetull
6.	Sandy	Assiniboine, Banks, Busby, Chanta, Chinook, Cozberg, Dast, Degrand, Dooley, Flasher, Glendive, Lisk, Manning, Parshall, Remmit, Tally, Trembles, Turner, Tusler, Twilight, Vebar
7.	Silty	Alona, Arnegard, Attewan, Bainville, Bonfri, Bowbells, Briggsdale, Cambeth, Cambert, Camborthids, Chama, Chanta, Cherry, Cooers, Creed, Cushman, Degrand, Delpoint, Ethridge, Evanston, Farland, Farnuf, Floweree, Forelle, Hillon, Kremlin, Lambert, Lambeth, Lonna, Marmarth, McRae, Morton, Pinelli, Ridgelawn, Reeder, Searing, Shambo, Telstad, Turner, Vanstel, Williams, Yamac, Zahill, Zahl
8.	Clayey	Abor, Barkof, Bascovy, Bickerdyke, Boettcher, Bowdoin, Dimmick, Ethridge, Harlem, Havre, Hesper, Hoffmanville, Julin, Kobar, Lohler, Macar, Marias, Marvan, Moreau, Nunn, Pendroy, Regent, Savage, Teigen, Thebo
9.	Thin Hilly*	Bitton, Delpoint, Lambert, Nihill, Zahill
10.	Thin Sandy	Dast, Flasher, Vebar
11.	Thin Silty	Bonfri, Cambeth, Cambert, Chama, Cushman, Delpoint, Marmarth, Nihill, Searing
12.	Thin Clayey	Abor, Sunburst
13.	Clay Pan	Absher, Adger, Archin, Creed, Elloam, Hovan, Ladner, Parchin, Rhoades, Rominell, Weingart
14.	Shallow to Gravel	Beaverton, Wabek, Lehr
15.	Shallow	Blackhall, Brandenburg, Cabba, Cabbart, Flasher, Kirby, Rentsac, Riedel
16.	Grazable Woodlands	Armells, Barvon, Birney, Bitton, Kirby, Lamdeer, Ringling, Twin Creek
17.	Gravelly	Rivra, Tinsley, Bitton
18.	Shallow to Clay	Dimyaw, Lisam, Lismas, Midway, Neldore, Norbert, Yawdim
19.	Shale	Dilts, Bascovy, Volborg
20.	Very Shallow	Kirby, Travessilla, Wibaux
21.	Thin Breaks*	Armells, Cabbart, Delpoint, Flasher, Yawdim
22.	Pan Spots*	Absher, Gerdrum, Nobe, Tealer, Thoeny
23.	Saline Uplands	Louscot
24.	Dense Clay	Absher, Lohler, Marias, Tealer, Vaeda, Vanda
25.	Dense Shale	Volborg, eroded phase
26.	Badlands*	Badlands (a miscellaneous land type, combination of many soils)

*A combination of other range sites

(a) Due to ongoing SCS and BLM soil surveys, additional soil series will be identified within the EIS area.
(b) Some soil series may be found in more than one range site, depending upon slopes, surface textures, and other factors which influence its production and potential management. Some series are more productive than others, but may be found in the same range site and, hence, have the same soil target cover assigned.

Rock Unit Youngest to Oldest	Geologic Age	Approximate Thickness (feet)	Lithology	Water Bearing Characteristics	Water Quality
Alluvium	Quaternary	0 to 40+	Sand, gravel, silt, clay	5 to 1000 gpm reported, most wells yield 10-20 gpm. Most productive aquifer in area, however, areal extent limited to major river valleys	Fair to good quality, used for stock & domestic. Typical dissolved salts are CA, MG, Na_2So_4; HCO_3
Glacial	Quaternary	Unreported	Fine sand, silt & clay, patchy distribution	Unreported	Unreported
Terrace	Quaternary	0 to 120+	Sand, gravel, silt, clay	5 to 500 gpm reported, most wells yield 5 to 20 gpm. Adequate for stock, domestic & small scale irrigation in localized areas	Ranges from highly mineralized to satisfactory for domestic and stock uses
Flaxville	Tertiary	0 to 40+	sand & gravel patchy distribution	Unreported	Unreported
Fort Union	Tertiary	0 to 1200+	Interbedded buff sandstone & shale, coal seams also present	2 to 20 gpm reported most wells yield 2-12 gpm. Most widely used aquifer in E.I.S. area	Adequate for stock & domestic, unsuited for irrigation. Shallow aquifers have 2500-4000 mg/1 dissolved solids. Dominate ions are Na, Mg, So_4. Deeper aquifers have 1500-2000 mg/1 and are sodium bicarbonate type. Sandstone squifers are often mineralized while coal seam aquifers are often pure & low in minerals
Upper Hell Creek	Cretaceous	0 to 600+	Irregular & discontinuous interbedded gray-brown sandstone & carbonaceous gray shale	Generally unproductive	Unreported
Lower Hell Creek - Fox Hills	Cretaceous	0 to 500+	Fine to medium grained, cross bedded sandstone	Most producing wells are in southeastern portion of E.I.S. area with yields of 8 gpm	Dissolved solids concentrations range from 500 to 2000 mg/1. Major ions are sodium and bicarbonate. Chloride concentration is greater than in overlying Ft. Union Formation.
Bearpaw Confining Layer	Cretaceous	200 to 1200	Dark colored shale	Not normally an aquifer, forms a base for the overlying shallow aquifer system.	Unreported

SOURCE: Montana Water Resources Board, Water Resources Surveys 1960, 1970A, 1970B, 1971A, 1971B; (Stoner and Lewis 1980)

APPENDIX 3.5: SURFACE QUALITY SURVEY

	Station	Sampling Date	Discharge cfs	Total Dissolved Solids	Conductivity unhos field	pH Field	Total Akalinity as CaCo, mg/l	Bicarbonate as HCO_3 mg/l	Chloride Dissolved as CL mg/l	Nitrate + Nitrate as N mg/l	Total Hardness as $CACO_3$ mg/l	Calcium Dissolved as CA mg/l	Magnesium Dissolved as MG mg/l	Sodium Dissolved as NA mg/l	Potassium Dissolved as K mg/l	Sulfate Dissolved as SO_4 mg/l
Muster	#1	3-15	32	185	300	8.4	76	88	1.4	0.46	39	11	2.9	49	3.4	69
Creek near		4-3	1.0	551	865	8.3	150	180	2.4	0.67	96	22	10	150	3.0	270
Kinsey, Mt.		5-31	0.19	1090	1610	8.4	180	220	3.8	3.6	110	25	11	310	0.4	620
		7-26	0.72	830	1150	8.5	220	270	22	2.7	140	30	16	180	5.9	430
Cherry	#2	10-5	E.10	2290	3170	8.4	400	-	14	.01	640	110	88	520	9.7	1300
Creek near		11-7	E.10	2140	2990	8.3	400	-	9.8	.01	610	110	81	480	8.5	1200
Terry, Mt.		4-12	29	1100	1660	8.2	220	-	5.8	.04	410	64	60	200	5.6	620
		5-10	6.5	1640	2350	8.3	360	-	8.9	.00	690	120	95	280	6.7	910
		6-14	0.14	2130	3020	8.1	380	-	8.9	.00	670	120	91	460	9.7	1200
Seven Mile	#3	10-3	.45	1770	2450	8.0	420	510	12	.01	940	130	150	280	10	920
Creek near		3-13	14	931	1300	8.2	210	260	7	.54	460	68	70	140	9.4	500
Lindsay, Mt		4-6	8.7	1290	1740	8.0	310	380	7.3	.07	740	100	120	150	8.5	700
		5-10	13	1450	1920	8.4	360	420	7.6	.00	850	110	140	170	7.8	800
		6-22	.47	1790	2090	8.1	400	490	8.6	.08	880	120	140	260	8.8	1000
Burns	#4	1-12	.44	1260	1750	7.5	480	-	7.5	.04	560	83	85	240	9.2	530
Creek near		3-22	89	454	760	8.1	160	-	3.6	.15	250	39	36	62	8.4	200
Savage, Mt.		4-10	534	284	440	8.0	110	-	2.4	.29	170	32	22	28	5.2	120
		5-18	13	1310	1860	8.4	440	-	7.2	.01	640	91	100	210	8.4	620
		6-14	2.5	1210	1780	8.4	440	-	6.9	.02	540	64	93	230	8.6	530
Beaver	#5	2-27	3.7	1920	2720	7.9	360	-	8.2	.44	700	130	92	350	9.3	1100
Creek near		3-29	99	674	1025	7.6	130	-	3.2	1.6	290	55	37	100	11	380
Wibaux, Mt.		4-10	653	539	895	7.9	120	-	3.0	.44	260	50	32	75	8	290
		5-17	23	1710	2320	8.3	380	-	7.6	.03	680	120	93	310	8.8	930
		6-14	7.9	1860	2500	8.1	260	-	8.2	.01	620	110	83	380	9.8	1100
Redwater	#6	2-20	.6	4040	5700	7.7	490	-	17	.14	1200	140	210	850	12	2500
River near		3-19	143	488	820	8.0	110	-	3.2	.53	230	40	32	70	8.6	260
Circle, Mt.		4-11	489	841	1290	8.2	160	-	3.8	.62	420	62	64	120	7.7	480
		5-9	50	3040	4000	8.4	430	-	10	.32	1200	69	240	550	11	1900
		6-5	13	3440	4500	8.3	480	-	17	.04	1300	150	220	550	10	2200
Horse	#7	11-14	.99	6060	7200	8.3	810	-	24	.01	1600	110	320	1400	14	3700
Creek		3-19	20	1060	1670	7.8	200	-	3.4	.51	340	41	57	230	9.3	590
		4-11	126	473	749	8.0	110	-	2.4	.21	210	32	32	76	6.5	250
		5-9	15	2540	3480	8.3	380	-	5.0	.01	860	81	160	450	11	1600
		6-5	2.8	4040	6150	8.5	690	-	6.4	18	1100	87	220	900	10	2400
Crow Rock	#8	3-22	97	262	397	7.8	86	110	2.7	.27	110	27	9.6	42	9	110
Creek near		4-4	6.7	797	1160	8.1	180	220	4.0	.11	250	47	31	160	9.5	430
Cohagen, Mt.		5-31	.22	3340	4650	8.6	480	490	19	.01	810	110	130	800	14	2000
		6-13	.01	3600	4430	8.6	460	520	10	.01	760	89	130	880	15	2200

	Station	Sampling Date	Discharge cfs	Total Dissolved Solids	Conductivity unhos field	pH Field	Total Akalinity as CaCo, mg/l	Bicarbonate as HCO_3 mg/l	Chloride Dissolved as CL mg/l	Nitrate + Nitrate as N mg/l	Total Hardness as $CACO_3$ mg/l	Calcium Dissolved as CA mg/l	Magnesium Dissolved as MG mg/l	Sodium Dissolved as NA mg/l	Potassium Dissolved as K mg/l	Sulfate Dissolved as SO_4 mg/l
Timber	#9	3-21	47	1180	1770	8.2	230	-	5.7	.13	25	33	40	300	8.2	650
Creek near		4-17	128	-	2080	8.3	210	-	-	.11	42	58	67	290	6.5	-
Van Norman,		5-08	27	3210	4220	8.5	440	-	9.1	.01	75	84	130	800	13	1900
Mt		6-04	3	5140	6500	8.5	770	-	1.3	-	94	81	180	1400	12	3000
Prairie	#10	3-30	55	349	590	8.2	150	-	7.2	.31	11	27	9.3	82	6.5	120
Elk Cr. near		4-10	794	180	320	8.0	78	-	2.3	.22	5	14	5.0	41	4.4	60
Oswego, Mt.		5-14	8	2110	3000	8.6	460	-	16	.02	42	70	60	570	7.7	1100
		6-6	3.6	1610	2460	8.7	630	-	7.8	.18	18	29	27	500	6.1	650
Nelson	#11	12-12	E.10	6960	9200	8.1	1160	-	37	.02	110	68	230	26	20	3900
Creek near		3-25	52	273	447	8.3	66	-	4.5	.13	8	16	10	3	4.5	130
Van Norman,		4-17	125	627	1080	8.2	110	-	2.4	1.0	19	31	27	3.8	4.3	370
Mt		5-3	3.2	3820	4820	8.5	550	-	11	.02	89	77	170	13	9.6	2300
		6-4	0.98	6090	7380	8.4	750	-	18	.03	110	83	220	17	11	4000
Musselshell	#12	3-7	313	1520	2000	8.0	280	-	15	.47	76	160	88	200	5.0	870
River near		3-12	1700	456	700	8.2	69	-	7.1	.38	19	40	22	74	6.4	260
Mosby, Mt.		4-5	1340	1710	2260	8.3	270	-	20	.31	75	150	92	270	5.8	1000
		5-10	1900	1180	1725	8.4	250	-	16	.07	38	130	14	190	4.5	670
		6-13	454	1170	1610	8.4	220	-	12	.02	54	110	65	180	4.6	660
Clear	#13	2-22	E.04	1100	1560	7.5	220	270	8.4	.05	63	97	95	130	5.6	630
Creek near		3-18	26	503	720	8.0	170	203	4.2	.33	30	49	43	50	7.8	240
Hoyt, Mt.		4-8	14	1210	1670	8.0	310	375	8.8	.12	77	110	120	120	8.1	640
		5-11	11	1570	2050	8.3	360	434	9.9	.00	100	140	160	140	6.9	890
		6-22	1.2	1200	1630	8.3	340	410	7.7	.04	70	100	110	130	6.6	630
Deer	#14	3-14	24	482	730	8.1	130	160	5.7	.42	16	33	19	100	8.5	230
Creek near		4-3	33	1260	1800	8.1	300	370	10	.31	49	80	70	240	7.8	660
Glendive, Mt		5-10	17	2130	2700	8.5	440	500	14	.00	73	110	110	430	8.4	1200
		6-21	.48	1970	2620	8.4	390	460	16	.05	56	110	70	420	9.1	1100
		8-8	.04	2210	2720	8.5	550	660	18	.02	59	78	95	470	11	1200
Cottonwood	#15	12-1	E.10	3790	4400	7.7	680	-	15	.02	120	170	180	800	17	2200
Creek near		3-23	27	714	1080	7.9	150	-	3.3	.24	30	49	42	120	11	390
Intake, Mt.		4-12	21	1030	1530	8.1	210	-	3.4	.07	42	56	67	180	6.7	580
		5-17	.96	3580	4450	8.3	580	-	3.3	.02	130	170	220	720	11	2100
		6-14	.09	4300	5180	8.4	520	-	8.5	.00	130	120	240	910	12	2700
Little	#16	11-7	.14	2720	1350	8.0	570	-	15	-	85	110	140	590	16	1500
Beaver Creek		3-17	58	930	1375	8.2	160	-	8.1	-	45	65	70	120	10	550
near Wibaux,		3-25	15	1560	1550	7.9	270	-	9.8	-	75	120	110	230	11	910
Mt.		6-21	.14	2630	3250	8.3	460	-	16	-	92	120	150	550	11	1500

	Station	Sampling Date	Discharge cfs	Total Dissolved Solids	Conductivity unhos field	pH Field	Total Akalinity as CaCo, mg/l	Bicarbonate as HCO_3 mg/l	Chloride Dissolved as CL mg/l	Nitrate + Nitrate as N mg/l	Total Hardness as $CACO_3$ mg/l	Calcium Dissolved as CA mg/l	Magnesium Dissolved as MG mg/l	Sodium Dissolved as NA mg/l	Potassium Dissolved as K mg/l	Sulfate Dissolved as SO_4 mg/l
Yellowstone	#17	2-15	6890	581	960	8.0	180	-	18	.53	300	71	29	76	4.0	260
River near		4-29	13600	740	1130	8.3	190	-	15	-	330	67	39	120	5.0	370
Sidney, Mt.		5-16	11500	632	998	8.5	160	-	18	-	300	71	30	95	4.0	310
		6-13	19400	280	455	8.1	90	-	6.8	.16	150	35	14	37	2.5	120
		7-31	10600	428	685	8.5	130	-	10	.12	200	44	21	61	4.2	200
Missouri	#18	2-14	13300	499	810	8.3	150	-	9.4	.09	260	58	27	72	4.5	230
River near		4-19	48880	373	603	8.1	110	-	5.7	.26	170	39	18	60	4.9	170
Culbertson,		5-15	22500	578	910	8.1	150	-	9.8	.20	250	59	26	91	5.4	290
Mt		6-19	13700	579	864	8.2	150	-	9.4	.18	280	66	29	84	4.6	290
Powder	#19	2-8	120	1940	2800	7.8	370	-	210	.38	760	180	76	360	8.1	870
River near		4-24	835	2130	2950	8.2	230	-	110	.41	760	170	82	410	8.0	1200
Locate, Mt.		5-22	632	2110	2880	8.2	220	-	110	.54	710	160	75	400	21	1200
		6-26	514	1310	1890	8.1	160	-	72	.35	580	140	57	210	7.3	720

Source: USGS Water Resources Data For Montana, Water Year 1979

APPENDIX 3.6: BIG DRY EIS AREA RESERVOIR SEDIMENT SURVEY

Reservoir Name	Location Twp-Rng.-Sec	Date Constructed MO/YR	Age in Years	Designed Water Storage Capacity (ac-ft)	Existing Sediment Volume in Reservoir	Existing Water Storage Capacity (ac-ft)	% Sediment Trapped	Date Surveyed MO/DAY/YR	Soil Subgroup	Hydrologic Geomorphic Area	Reservior Sediment Yield (ac-ft/mi^2/yr)	Average Annual Water Yield ac-ft/mi^2/yr)
Barley	8N 43E 10	4/47	33	7.74	4.09	3.65	98	07/22/80	12	I	0.69	5.91
Brackett	16N 39E 3	/39	41	8.63	2.55	6.08	98	06/15/80	12	I	0.24	8.20
Bradac	6N 60E 12	9/58	22	1.20	0.95	0.25	64	09/12/80	14	IV	0.21	10.54
Chickie	15N 46E 12	9/36	44	8.92	1.44	7.48	72	08/19/80	12	I	0.07	15.73
Cornwell	6N 39E 2	3/47	33	4.70	1.37	3.33	98	06/26/80	14	IV	0.26	9.96
Don's	12N 37E 30	7/53	27	16.10	7.30	8.80	98	07/11/80	12	I	1.18	11.90
Gray	9N 54E 20	/52	28	5.61	2.28	3.33	97	08/22/80	13	III	0.31	13.24
Haughlan	11N 49E 2	/53	27	8.50	4.92	3.58	98	08/07/80	11	III	2.02	4.40
Keltner	13N 49E 2	/36	44	2.48	1.86	0.62	98	07/31/80	12	I	0.25	5.53
Lark	14N 55E 15	/68	13	2.86	0.57	2.29	93	06/25/81	15	IV	0.15	18.58
Lockie	7N 44E 4	7/44	36	5.92	1.09	4.83	98	06/30/80	12	I	0.34	2.80
MacKenzie	5N 53E 30	/51	29	2.90	0.44	2.46	98	08/21/80	15	IV	0.19	5.23
Shaw	14N 31E 10	/71	9	29.05	3.95	25.10	98	06/17/80	14	IV	3.13	7.00
Woodruff	7N 53E 7	/50	30	0.76	0.33	0.43	89	08/12/80	13	III	.16	3.53

APPENDIX 3.7: MANAGEMENT SYSTEMS AND TREND ON EXISTING AMPS

RECORD	TREND	PASTURES	SYSTEM	ACRES	REMARKS
2084	UP	4	DR	8753	
2549-2685	STABLE	3	DR	9169	
2550-2686				3586	Not implemented
2568-2832	UP	4	DR	9908	
2727	STABLE	5	DR	6575	
2728	STABLE	7	DR	3747	
2737	UP	6	DR	10826	
2738	STABLE	3	DR	2820	
2745	STABLE	4	DR	8417	
2750	DOWN	5/6	DR	23324	
2752	STABLE	3	RR	3673	
2755	STABLE	8	DR	11787	
2762	STABLE	3	DR	4315	
2763	STABLE	6	DR	10244	
2772	UP	12	DR	17304	
2773	STABLE	5	DR	6406	
2774	STABLE	6	RR	6958	
2786	STABLE	2	DR	3640	
2792	STABLE	3/2	DR	8599	
2793	STABLE	2	DR	4465	
2803	UP	4	DR	8512	
2807	DOWM	2	DR	1520	
2824-2826	STABLE	2	DR	5840	
2828	STABLE	3	DR	3361	
2829	UP	13	DR	1971	
2831	STABLE	3	DR	4213	
2838	UP	3	DR	8837	
2861	DOWN	4	DR	5496	
2873	UP	3	DR	9502	
2946	UP	3	RR	14008	

TOTAL 227776

SUMMARY

			PUBLIC LAND ACRES	TREND UP	TREND STATIC	TREND DOWN	TREND UNCLASSIFIED
REST ROTATION	#	3	24,639	14,008	10,631	0	0
	%	10	10.8	56.9	43.1	0	0
DEFERRED ROTATION	#	26	199,551	75,613	93,598	30,340	0
	%	87	87.6	37.9	46.9	15.2	0
NOT IMPLEMENTED	#	1	3,586	0	0	0	3,586
	%	3	1.6	0	0	0	100
TOTAL	#	30	227,776	89,621	104,229	30,340	3,586
	%	100	100.0	39.3	45.8	13.3	1.6

APPENDIX 3.8: MONTANA DEPARTMENT OF FISH AND GAME COMPUTER MODELING OF DEER DENSITIES

STATE OF MONTANA

DEPARTMENT OF

FISH AND GAME

Box 430
Miles City, Montana 59301
January 9, 1981

Ray Brubaker, District Manager
Bureau of Land Management
Miles City, Montana 59301

SUBJECT: Computer modeling of deer densities for forage allocations on public lands

Dear Mr. Brubaker:

Since you have asked for our assistance in providing deer numbers for consideration in forage allocations on Bureau of Land Management lands, I feel that these data must be qualified if our support is to be sustained. I further request that this qualification be emphasized in formal and/or legal document.

The computer run densities are derived from various population characteristics obtained during standard surveys. Some of these surveys include partial, incomplete censuses each of which reflect the limitations inherent in any known wildlife census technique. Differences in observers, densities and types of cover, time of day, behavior of the animals being observed, etc. all limit the completeness of a wildlife census. None of the census surveys used were intended to produce a number representing actual population conditions.

Further it is understood that results from computer modeling do not reoresent an absolute population estimate. Numbers generated are the best estimates currently obtainable with given survey procedures and only illustrate conditions during late summer 1980. The purpose of the computer estimates is to assist and not to stand as the sole indicator to determine wildlife forage allocations.

These qualifications must be emphasized so that anyone receiving the data does not incorrectly interpret their exactness. If the qualifications preface any discussion of the data, we will support them within the limits described.

Sincerely,

Keith G. Seaburg
Regional Supervisor

KGS:dm

STATE OF MONTANA

DEPARTMENT OF

FISH AND GAME

ASSUMPTIONS AND RATIONALE FOR DEER POPULATION ESTIMATES IN SOUTHEASTERN MONTANA

The Montana Department of Fish, Wildlife and Parks does not prefer to make total population estimates of deer by hunting districts due to the many variable factors necessary to make such estimates. However, due to the imperative need of the Bureau of Land Management, we have attempted to do this by computer population modeling and will defend our estimates as long as the assumptions and limitations are well understood.

Mule Deer:

Estimates of total mule deer numbers and densities were estimated at late summer 1980 levels by hunting district (Table 1). The original basis for the estimate was the number observed during intensive winter aerial surveys of the entire hunting district (see 1980 P.R. report for Region 7). The counts were expanded to a late winter population estimate using the rates of observability by habitat type listed in Table 2. The rates used to obtain the population estimates are from personal communication with Dr. Richard J. Mackie and David Pac, deer research biologists who have worked with this problem. The high and low estimates are based on the range of observability rates of those found by Mackie and Pac.

These populations were then modeled from the winter survey date to late summer 1980, which varied from 1-3 years. For this modeling, we had to input data about age and sex composition, fawn production, hunter kill and natural mortality. Winter age and sex structure was assumed to be 20% adult bucks, 13.3% coming yearling bucks, 52.6% adult does and 14% coming yearling does, based on field observations and age structure of the harvest. Fawn production was obtained from annual September - October production surveys. Hunter kill was from the Department's harvest survey and corrected for a 20% crippling loss, based on Department studies. Natural mortality rates were based on prior computer modeling work on prairie mule deer populations. Summer mortality was assumed to be 2% for older age classes; it was not necessary to calculate summer fawn mortality since fawn:doe ratios were obtained in September-October. Winter mortality varied with winter severity and was assumed to be that presented in Table 3.

White-tailed Deer:

The whitetail population estimates (Table 4) were not derived from computer models due to the lack of sufficient data. The basis for the estimate was the winter survey results, using the same observability rates as for mule deer (Table 2). The final estimate was computed by adding fawn production, using the September-October 1980 fawn:doe ratios and assuming that does comprised 67% of the yearling plus adult population.

Table 1. Estimates of total mule deer numbers in late summer 1980.

Hunting District	Low Estimate Total Number	Low Estimate Deer/mi^2	High Estimate Total Number	High Estimate Deer/mi^2	Hunt. Unit (Sq. Mi)
700	11,064	4.2	12,064	4.6	2,634
710	3,778	2.6	4,483	3.1	1,452
711	6,325	7.4	7,874	9.2	854
712	5,669	4.2	7,225	5.4	1,346
713	4,042	4.9	5,215	6.3	830
714	659	1.9	1,009	3.0	341
730	6,740	3.1	7,943	3.7	2,155
731	8,916	4.8	11,535	6.3	1,836
732	6,323	5.2	7,544	6.2	1,224
733	2,014	0.8	2,531	1.0	2,450
750	3,552	3.8	4,094	4.4	929
760	7,815	9.7	10,089	12.6	803
761	16,826	8.7	20,117	10.4	1,929
770	8,026	7.7	9,529	9.1	1,043
782	2,634	4.4	3,152	5.6	599
	94,383		114,404		

Table 2. Observability rates by habitat type for winter deer surveys.

Habitat type	Low Estimate Percent Observed	Low Estimate Observability Rate	High Estimate Percent Observed	High Estimate Observatility Rate
Thick pine	30	3.33	30	3.33
Scattered pine and juniper	40	2.50	35	2.86
Nontimbered rough breaks	45	2.22	35	2.86
Creek riparian	50	2.0	40	2.50
River riparian	50	2.0	30	3.33
Grassland and dryland agriculture	60	1.67	50	2.0

Table 3. Mortality rates for winter

Year	Fawns	Yearling Males	Yearling Females	Adult Males	Adult Females
1977-78	35%	8%	10%	8%	18%
1978-79	40%	8%	10%	8%	18%
1979-80	20%	4%	4%	4%	8%

Table 4. Estimates of total white-tailed deer numbers in late summer 1980.

Hunting District[c]	Low Estimate Total Number	Low Estimate Deer/Mi.^{2}	High Estimate Total Number	High Estimate Deer/mi.^{2}
700	533[a]	0.2	813[a]	0.3
710	240	0.2	279	0.3
711	74	0.1	110	0.1
712	188	0.1	243	0.2
713	-[b]		-[b]	
714	3,199	9.4	5,326	15.6
730	1,016	0.5	1,514	0.7
731	5,800	3.2	7,250	3.9
732	6,041	4.9	7,488	6.1
733	6,597	2.7	9,384	3.8
750	6,022	6.5	9,776	10.5
760	781	1.0	812	1.0
761	4,002	2.1	5,930	3.1
770	1,015	1.0	1,269	1.2
782	347	0.6	467	0.8
Total	35,882		50,876	

[a] Exluding the east bank of the Musselshell River.

[b] No whitetails observed during the winter flight.

[c] See Table 1 for Hunting District Size.

Conclusions:

The deer population estimates by hunting district presented in Table 1 and 4 are for the late summer 1980 period only. This period was chosen because the estimates best reflect the deer populations during the summer grazing period. Mackie (pers. communication) indicated that the higher population estimates were probably closer to the true population size, especially for white-tailed deer. We concur with this. We will defend these estimates, but only for late summer 1980 because the mule deer populations are increasing and the white-tailed deer populations are fluctuating, showing rapid increases and sporadic die-offs due to winter and epizootic mortalities. With additional data these estimates could be updated and refined.

January 9, 1980

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APPENDIX 3.9: MAXIMUM ANTELOPE OCCURRENCE WITHIN THE EIS AREA BY HUNTING DISTRICT

Hunting District	Survey Year	Number of Antelope	Hunting District Size (sq. mi.)	Area of H.D. Used by Antelope (sq. mi.)	Antelope Per Sq. Mi.
700	1974	3,872	2,632	1,538	2.5
710	1975	1,804	699	483	3.7
711	1975	2,994	854	687	4.4
712	1975	592	943	565	1.0
713	1975	1,406	946	511	2.8
714	1973	1,353	953	543	2.5
730	1974	3,393	1,438	1,359	2.5
731	1975	1,251	1,056	950	1.3
732	1975	942	1,242	902	1.0
733	1974	1,569	2,433	2,050	0.8
750	1973	287	929	470	0.6
760	1975	567	816	522	1.1
761	1975	1,911	1,922	1,282	1.5
770	1975	1,825	1,055	778	2.3
780	1975	1,462	947	721	2.0

SOURCE: Montana Department of Fish, Wildlife and Parks, Region 7, Pittman-Robertson (P.R.) Reports (largely from PR W-130-R-11, Table 4)

APPENDIX 3.10: METHODOLOGY FOR ASSESSING RANCH RELATED ECONOMIC IMPACTS

The first step in the process involved matching each allotment in the EIS study area with the respective ranch operation. Some ranch operations have only one public grazing allotment, others have a number of allotments involving existing allotment management plans (AMPs) or proposed AMPs and non-AMPs.

There is a total of 708 individual ranch operations with public grazing privileges in the study area. One hundred of these 708 ranches have 25 or fewer public AUMs. The public AUMs are virtually unimportant to these ranches, so the analysis concentrates on the 608 remaining ranch operations.

Through the use of BLM grazing records, personal knowledge of Miles City District BLM employees and Agricultural Stabilization and Conservation Service (ASCS) crop records, the 608 ranches were placed in 12 size-and-type categories (Table 3-11). The predominate type of ranch is a cow/calf operation. Also, as indicated on Table 3-11, many of the operations also produce cash crops, primarily wheat.

To determine dependency of ranches on public grazing, the total AUM grazing requirement for the ranches was computed. This was accomplished by multiplying 7.5 times the total estimated number of animal units (AUs) in each ranch. Seven and one-half was used because it is estimated that, on the average, ranch operations in the EIS study area graze seven and one-half months and feed hay and supplement the other four and one-half months. To determine the percentage of dependency of each operation on public grazing, the number of public AUMs permitted was divided by the total ranch AUM requirements. Table 3-10 summarizes these determinations: Percentage dependency = public AUMs divided by (7.5 months x number of ranch AUs).

The number of livestock on ranches within each size category was averaged. Results of the averaging indicated the following: 0-150 cows, average 100 cows; 151-374 cows, average 250 cows; 375-749 cows, average 500 cows and 750 plus cows, average 1500 cows.

Ranch budgets were constructed for each of the four average size ranches. A representative crop enterprise budget was developed for those farms/ranches having cash crops. The crop budgets are for producing hard red winter wheat following fallow.

The Economics and Research Service (USDA, ERS) developed the representative budgets, using, in part, budget data gathered in a national cost of production study in 1979. This data was supplemented by location information gathered by BLM regarding such production items as calf crops, calf weaning weights, forage requirements, etc. (Cornelius, 1977). The BLM gathered this type of data to arrive at, for example, the average weaning weights for heifers and steers in the study area. Appendices 3.10A through 3.10E summarize the representative livestock and crop budgets.

A linear programming model was developed by ERS for each of four livestock sizes. The linear programming model maximizes ranch income based on a series of production parameters and constraints. To determine the economic impacts on the ranch, the level of public grazing was varied (increased, decreased or eliminated) according to the proposed change in public AUMs under each alternative. For example, under the no grazing alternative, 100 percent of the public AUMs are eliminated from the representative ranch.

It is very difficult to project how ranchers would adjust their operations given a change in public AUMs. Each ranch operation is unique, and the adjustment by each rancher to a change in public AUMs would probably vary somewhat. It was assumed that the most likely response of ranchers to decreases in public AUMs would be to reduce the size of the ranch operation. Small ranches would probably be less likely to reduce the size of their operations and would probably purchase hay, for example, to compensate for the loss of public grazing. If BLM increased the number of AUMs, ranchers would not necessarily increase the size of their cow/calf operations. They might, run more yearlings, for example, or they might reallocate grazing in spring and fall to public pastures, so that less winter feed must be purchased.

The impact on ranch income is measured only in terms of change in the number of BLM AUMs. There may be changes in ranch returns that do not directly relate to the change in quantity of AUMs. Not enough data are available at this time in the study area to conclusively quantify the extent of these additional ranch returns due to AUM quality, so they were not evaluated in the analysis.

Implementation of grazing systems would increase the cost to ranch operations in such areas as increased fence maintenance, more movement of livestock and increased effort in monitoring forage conditions. These costs are included in the budget models.

Using the linear programming model, then, the change in ranch income (gross receipts about cash costs and depreciation), was calculated given a change in public AUMs. Private and state lands are intermingled with public lands, so a reduction in public grazing can cause a reduction in private and state grazing. However, in the calculations, grazing on state and private lands are not reduced.

It is interesting to note the decreases in income per AUM under various decreases in public and associated state and private AUMs. For example, with a 50 percent decrease in public AUMs, income (gross receipts above cash cost and depreciation) on a 100 cow ranch would decrease $9.38 per AUM. The loss in forage value to the nation amounts to $11.74 per AUM ($9.38 + $2.36 (1980 grazing fee) = $11.74). A 15 percent increase in public AUMs for the same size ranch would increase ranch income $3.77 per AUM. The increase to the nation in forage value would be $7.53 ($5.17 + $2.36 = $7.53). The decrease per AUM is greater than the increase largely because of cost structure. Ranches have a certain amount of fixed costs that are not reduced proportionally with reduced AUMs. They must continue to pay these fixed costs at least in the short term.

In the ranch budgets developed by ERS, different responses for income maximization were necessary depending on whether there were decreases or increases in public AUMs. With income maximization, a decrease in public AUMs results in a decrease in herd size. However, an increase in public AUMs results in no increase in herd size. However, costs do decrease, so income increases.

Also of interest is a comparison of this forage value for an AUM with the fair market value as determined by the ERS. In Montana the average monthly rate per head for pasturing cattle on private land in 1980 was $9.40 (USDA, ESS, 1980, Farm Real Estate Market Developments). This is very close to the value arrived at through linear programming and it tends to support the data and approach used in the analysis.

It is estimated that an average value for BLM grazing permits in the study area is approximately $100 per AUM. For those ranchers who have purchased BLM permits at $100 per AUM or $1,200 per AU, it is possible to calculate the price they are paying for public AUMs. Using an opportunity cost of capital of 9.3 percent, the cost of owning the BLM permit is $9.30 per AUM. Adding the grazing fee of $2.36 results in a total price per AUM of $11.66.

As mentioned above, the assumption is made that ranchers would vary herd size in response to changes in BLM grazing. These changes in herd size would affect the number of ranch employees needed. Changes in ranch workers were calculated using the following assumptions: one employee is needed for each 250 cows above the initial 250, and the number of employees would vary directly according to herd size changes. Thus if an operation increased its cow herd from 500 to 750 it would be assumed that 1 equivalent to full time worker would be needed in addition to the 1 already employed.

The economic analysis uses average livestock prices for 1977, 1978 and 1979. Cost figures are for 1979. Historically, livestock prices have changed dramatically every three to five years, whereas production costs have risen consistently. A point could be raised as to the validity of using these figures to project economic impacts into the future. It has been assumed in this analysis that the cost/price relationship would remain fairly constant over the long term, with upward pressure on both costs and prices due to economy-wide inflation. Therefore, although the magnitude of the figures will increase the relative impact would remain constant.

APPENDIX 3.10A: COSTS AND RETURNS FOR BEEF HERDS OF 0-150 COWS

Item	Unit	Quantity	Average Weight	Price Cwt	Total Value
Sales:					
Steer calves	Head	39	430	82.00	13,751
Heifer calves	Head	22	390	73.90	6,341
Yearling steers	Head	4	700	71.34	1,998
Yearling heifers	Head	8	650	67.43	3,506
Cull cows	Head	12	1,000	42.73	5,128
Total					30,724
Total/cow					307.24

	Total Value	Value/ Cow
Cash Costs:		
BLM grazing fee	351	3.51
Forest grazing fee	-	-
Private range lease/rent	461	4.61
State lease	246	2.46
Hay (product)	3,611	36.11
Hay (purchase)	1,089	10.89
Protein supplement	707	7.07
Irrigated pasture	-	-
Salt and mineral	152	1.52
Concentrate feeds	226	2.26
Veterinary and medicine	351	3.51
Hired trucking	149	1.49
Marketing	277	2.77
Fuel and lubricants	1,619	16.19
Repairs	1,151	11.51
Real estate taxes	2,600	26.00
Other taxes	145	1.45
Insurance	661	6.61
Interest on operating capital	929	9.29
General farm overhead	226	2.26
Interest on long term debt	5,200	52.00
Hired labor	781	7.81
Total cash costs	20,932	209.32
Other Costs:		
Family labor	3,550	35.50
Depreciation	2,990	29.90
Interest on investment, other than land	10,463	104.63
Interest on land investment	45,729	457.29
Total other costs	62,732	627.32
Total all costs	83,664	836.64
Return above cash costs	9,792	97.92
Return above cash costs & family labor	6,242	62.42
Return to total investment	3,252	32.52
Return to land	-7,211	-72.11

Herd size 150 cows; 92% calf crop; 5% calf loss; 3% annual cow loss; 2% yearling loss; 20% replacement rate; and 25 cows per bull.

APPENDIX 3.10B: COSTS AND RETURNS FOR BEEF HERDS OF 151-374 COWS

Item	Unit	Quantity	Average Weight	Price Cwt	Total Value
Sales:					
Steer calves	Head	98	430	82.00	34,555
Heifer calves	Head	54	390	73.90	15,563
Yearling steers	Head	11	700	71.34	5,493
Yearling heifers	Head	21	650	67.43	9,204
Cull cows	Head	30	1,000	42.73	12,819
Total					77,634
Total/cow					310.54

	Total Value	Value/ Cow
Cash Costs:		
BLM grazing fee	875	3.50
Forest grazing fee	-	-
Private range lease/rent	1,145	4.58
State lease	612	2.45
Hay (product)	9,019	36.08
Hay (purchase)	2,706	10.82
Protein supplement	1,662	6.65
Irrigated pasture	-	-
Salt and mineral	381	1.52
Concentrate feeds	357	1.43
Veterinary and medicine	1,067	4.27
Hired trucking	545	2.18
Marketing	108	.43
Fuel and lubricants	3,890	15.56
Repairs	3,351	13.40
Real estate taxes	6,342	25.37
Other taxes	409	1.64
Insurance	1,627	6.51
Interest on operating capital	2,185	8.74
General farm overhead	1,721	6.88
Interest on long term debt	13,000	52.00
Hired labor	3,679	14.72
Total cash costs	54,681	218.73
Other Costs:		
Family labor	4,680	18.72
Depreciation	7,952	31.81
Interest on investment, other than land	25,994	103.98
Interest on land investment	111,213	444.85
Total other costs	149,839	599.36
Total all costs	204,520	818.08
Return above cash costs	22,953	91.81
Return above cash costs & family labor	18,273	73.09
Return to total investment	10,321	41.28
Return to land	-15,673	-62.70

Herd size 250 cows; 92% calf crop; 5% calf loss; 3% annual cow loss; 2% yearling loss; 20% replacement rate; and 25 cows per bull.

APPENDIX 3.10C: COSTS AND RETURNS FOR BEEF HERDS OF 375-749 COWS

Item	Unit	Quantity	Average Weight	Price Cwt	Total Value
Sales:					
Steer calves	Head	196	430	82.00	69,110
Heifer calves	Head	107	390	73.90	30,838
Yearling steers	Head	22	700	71.34	10,986
Yearling heifers	Head	42	650	67.43	18,408
Cull cows	Head	60	1,000	42.73	25,638
Total					154,980
Total/cow					309.96

	Total Value	Value/ Cow
Cash Costs:		
BLM grazing fee	1,767	3.53
Forest grazing fee	-	-
Private range lease/rent	2,318	4.64
State lease	1,240	2.48
Hay (product)	18,170	36.34
Hay (purchase)	5,500	11.00
Protein supplement	2,790	5.58
Irrigated pasture	-	-
Salt and mineral	761	1.52
Concentrate feeds	714	1.43
Veterinary and medicine	1,585	3.17
Hired trucking	1,318	2.64
Marketing	1,773	3.55
Fuel and lubricants	5,450	10.90
Repairs	7,609	15.22
Real estate taxes	10,362	20.72
Other taxes	1,104	2.21
Insurance	3,487	6.97
Interest on operating capital	4,211	8.42
General farm overhead	1,998	4.00
Interest on long term debt	26,000	52.00
Hired labor	3,992	7.98
Total cash costs	102,149	204.30
Other Costs:		
Family labor	9,778	19.56
Depreciation	26,373	52.75
Interest on investment, other than land	54,953	109.91
Interest on land investment	176,956	353.91
Total other costs	268,060	536.13
Total all costs	370,209	740,43
Return above cash costs	52,831	105.66
Return above cash costs & family labor	43,053	86.10
Return to total investment	16,680	33.35
Return to land	-38,273	-76.56

Herd size 500 cows; 92% calf crop; 5% calf loss; 3% annual cow loss; 2% yearling loss; 20% replacement rate; and 25 cows per bull.

APPENDIX 3.10D: COSTS AND RETURNS FOR BEEF HERDS OF OVER 750 COWS

Item	Unit	Quantity	Average Weight	Price Cwt	Total Value
Sales:					
Steer calves	Head	578	430	82.00	203,803
Heifer calves	Head	343	390	73.90	98,856
Yearling steers	Head	64	700	71.34	31,960
Yearling heifers	Head	30	650	67.43	13,149
Cull cows	Head	225	1,000	42.73	96,142
Total					443,910
Total/cow					295.94

	Total Value	Value/ Cow
Cash Costs:		
BLM grazing fee	5,220	3.48
Forest grazing fee	-	-
Private range lease/rent	7,380	4.92
State lease	3,946	2.63
Hay (produce)	42,837	28.56
Hay (purchase)	15,760	10.51
Protein supplement	3,720	2.48
Irrigated pasture	-	-
Salt and mineral	2,284	1.52
Concentrate feeds	893	.60
Veterinary and medicine	4,755	3.17
Hired trucking	3,765	2.51
Marketing	5,595	3.73
Fuel and lubricants	12,390	8.26
Repairs	13,965	9.31
Real estate taxes	46,129	30.75
Insurance	9,539	6.36
Interest on operating capital	18,200	12.13
General farm overhead	7,350	4.90
Other cash costs	76,500	21.00
Hired labor	29,336	19.56
Total cash costs	309,564	206.38
Other Costs:		
Family labor	11,970	7.98
Depreciation	37,877	25.25
Interest on investment, other than land	126,683	84.45
Interest on land investment	872,768	581.85
Total other costs	1,049,298	699.53
Total all costs	1,358,862	905.91
Return above cash costs	134,346	89.56
Return above cash costs & family labor	122,376	81.58
Return to total investment	84,499	56.33
Return to land	-42,184	-28.12

Herd size 1,500 cows; 92% calf crop; 5% calf loss; 3% annual cow loss; 2% yearling loss; 20% replacement rate; and 25 cows per bull.

APPENDIX 3.10E: MONTANA—HARD RED WINTER WHEAT FOLLOWING FALLOW

ITEM	UNIT	PRICE/UNIT	QUANTITY	VALUE/ACRE
Sales:				
Wheat	BU	3.19	26.2	83.58
Total Receipts				83.58
Cash Costs:				
Preharvest:				
Insecticide				.07
Herbicide				1.00
Seed				3.50
Nitrogen				3.23
Phosphate				2.59
Fertilizer Appl.				.21
Tractor fuel and lube				1.78
Tractor repairs				1.16
Machine fuel and lube				.89
Machine repairs				2.13
Machine labor				3.42
Harvest:				
Custom combine and haul				2.64
Machine fuel and lube				.84
Machine repairs				1.35
Machine labor				1.08
Taxes				1.06
Insurance				.63
Gen. farm overhead				5.24
Interest on oper capital				2.35
Total Cash Costs:				35.17
Other Costs:				
Depreciation				12.98
Interest on investment other than land				5.62
Total Other Costs:				18.60
Total all costs				53.77
Return above cash costs				48.41
Return to total investment				35.43
Return to land				29.81

SOURCE: BLM 1981

APPENDIX 3.11: METHODOLOGY FOR SOCIAL IMPACT ASSESSMENT

A BLM sociologist conducted a total of 61 interviews with permittees in the Big Dry Resource Area (approximately 8% of total area permittees) during July and August of 1981. All but one of the interviews were conducted on the telephone. A random sample of ranchers to be interviewed was drawn from the area range users list using a table of random numbers. The original sample drawn included 71 area ranchers, or 10% of total area permittees. However, due to time constraints and the difficulty involved in contacting some area permittees during haying season, only 61 useable interviews were obtained.

Because of OMB restrictions, the interviews resembled guided conversations rather than a structured survey. Consistency of data from one interview to the next was obtained by using a list of key topics which were covered in most interviews. Responses were later analyzed for information and attitudes regarding significant social and natural resource issues. Natural resource issues covered included existing range condition and trend, uses and nonuses of public land, and attitudes regarding the proposed action and alternatives under consideration. Social issues included values and beliefs about the local lifestyle, perceptions of the BLM, and some demographic data. Additional information regarding attitudes relevant to the EIS was obtained via written comments submitted as part of the earlier public participation process, and via a BLM survey of community leaders and ranchers conducted in July and August of 1979, which was designed to identify public issues relevant to natural resource management of public lands.

The interviews that were conducted for the social impact assessment are not assumed to be fully representative of the views of every member of the affected community. Therefore, caution must be used in interpreting this information to represent the entire range of attitudes in the EIS area, or in saying the percentage of respondents with a given belief can be generalized to a proportion of the entire population.

APPENDIX 3.12: METHODOLOGY FOR ASSESSING REGIONAL ECONOMIC IMPACTS

Analysis of the impacts of the alternatives on intensive study area output, earnings and employment is based on the Water Resource Council Regional Industrial Multiplier System (RIMS). The system was developed by the Regional Economic Analysis Division, Bureau of Economic Analysis (BEA), U.S. Department of Commerce. A complete explanation of the methodology and procedures for RIMS is provided in *Water Resources Council Guide 5: Regional Multipliers*. Also, an example of the application of RIMS to river basin planning is available to *Regional Industrial Multiplier System—A Guide for River Basin Analysts*, USDA Forest Service.

This section briefly explains RIMS and shows how it is applied in the regional impact analysis. RIMS is essentially a technique for estimating regional output multipliers which can be used to measure the impact of EIS alternatives on output. Changes in income and employment can be estimated from this output base.

RIMS is based on an input-output (I-O) model. The I-O model is composed of three parts; a processing sector, a final demand sector and a payments sector. The processing sector is divided into industries and displayed as a matrix; each industry is represented by a column showing purchases of that industry and a row showing its sales to others. Each element in the matrix shows the sales of the producing (row) industry to the purchasing (column) industry.

To the processing sector are added several rows for the payments sector (which includes imports, payments to governments, depreciation and payments to households) and several columns for the final demand section (which includes government purchases, exports from the region and purchases of goods and services by households). It is important to remember that the final demand sector is the only autonomous sector in the economy and any change in production in the processing sector is a response to a change in demand.

The input-output table is constructed, in this case, for the BEA Economic Area - 095 - Billings, Montana. Since the BEA area represents a larger geographic area than the study area, the RIMS multipliers tend to overestimate impact.

The industry-specific multipliers are calculated by first assuming that the regional economy is similar, but not identical to the national economy. The regional I-O table is constructed by "regionalizing" the national I-O table. The results of this procedure give the following gross output multipliers and components for the BEA Economic Area - 095 (Table 1). Only the industrial sectors whose final demand will change under the various EIS alternatives are listed.

Based on these gross output multipliers, the impact on the study area output, earnings and employment for each of the alternatives can be calculated. In this analysis the ranching and construction industries are being examined. (Increases in study area earnings and employment due to increases in federal government employment are calculated directly from estimates of the number of new employees that will be needed in each alternative.) The first step in the analysis is to estimate increases/decreases in final demand. With respect to the ranching industry, this is accomplished by calculating the changes in gross livestock sales due to changes in public AUMs.

The change in final demand is multiplied by the appropriate gross output multiplier to determine the impact on gross output for the region. The gross output is then multiplied by the gross output to earnings factor to determine changes in earnings in the region. Earnings are then multiplied by the employment/earnings ratio for the region to determine the impact on employment.

TABLE 1: BEA ECONOMIC AREA—095—BILLINGS, MONTANA

Industrial Sector	WRC Sector No.	Direct Effect Component	Indirect Effect Component	Gross Output Multiplier	Household Coefficient
Meat, Animals	03	.863	.718	2.581	.158
Construction	18	.545	.447	1.992	.289
Trade	54	.667	.550	2.217	.513
Services	56	.682	.563	2.245	.487

APPENDIX 4.1: EFFECTS OF LAND TREATMENTS

IMPACTS ON SOILS AND WATERSHED	MECHANICAL TREATMENTS (ALT. A, B AND C)														GRAZING SYSTEMS (ALT. A, B AND D)											
	Plowing & Seeding		Ripping Chiseling 50% of Surface		Contour Furrowing		Chaining Cabling Railing Dozing		Water Spreader		Fire		Chemical		Rest Rotation		Deferred Rotation		Deferred		Seasonal		No Grazing		No Action (Alt. D)	
	ST	LT	ST	LT	ST	LT	ST	LT	ST	LT	ST	LT	ST	LT	ST	LT	ST	LT	ST	LT	ST	LT	ST	LT	ST	LT
Erosion and Sedimentation	+	-	+	-	-	-	+	-	-	-	+	-	+	-	+	-	0	-	0	-	0	-	-	-	0	+
Vegetation Production	-	+	-	+	-	+	-	+	+	+	+	+	+	+	0	+	0	+	0	+	0	+	+	+	0	-
Nutrient Availability	+	-	-	+	+	-	+	0	0	+	+	0	0	0	0	0	0	0	0	0	0	0	+	+	0	-
Soil Moisture	+	+	+	+	+	+	+	+	+	+	+	+	+	+	0	+	0	+	0	+	0	+	+	+	0	-
Water Quality	-	+	-	+	-	+	-	+	+	+	-	+	-	+	0	+	0	+	0	+	0	+	+	+	0	-
Soil Salts	+	+	+	+	+	-	0	0	-	-	0	0	0	0	0	0	0	0	0	0	0	0	0	-	0	0
Change in grazing pattern and intensity	+	+	+	+	+	+	+	+	+	+	+	+	-	+	0	+	0	+	0	+	0	+	-	-	0	0
Soil Development	-	+	0	+	-	+	-	+	+	+	-	+	0	+	0	+	0	+	0	+	0	+	+	+	0	-
Soil Surfact texture changes (amount of clay content)	+	+	0	+	+	+	+	+	0	+	0	+	0	+	0	+	0	+	0	+	0	+	0	-	0	+

APPENDIX 4.2: METHODOLOGY OF CALCULATING WATERSHED IMPACTS

The effects of grazing on sediment and water yields depend upon the grazing duration, intensity and season of use, as well as soil, climate, vegetation and topographic interactions. Because of the complexity of these interactions, only generalizations are possible. The figures for sediment and water yields appear as exact numbers, but are actually estimates

The figures for sediment yields were derived from data taken in a reservoir sediment survey. Fourteen reservoirs from three of the four hydrologic geomorphic areas (glossary) were surveyed in the Big Dry EIS area. Data from the fourth hydrologic geomorphic area, glaciated plains, was taken from the Prairie Potholes EIS, since data was unavailable in the Big Dry area

Sediment yield ranges were produced for each hydrologic geomorphic area. It is assumed the low end of the range represents a watershed in good to excellent condition, the middle of the range, a watershed in fair to good condition, while the high end of the range represents a watershed in poor condition

Initial or existing sediment yields were estimated using sediment yield ranges, SVIM inventory, and range condition mapping. Effects of each alternative were projected on each of the four hydrologic geomorphic areas. For instance, in the existing situation hydrologic geomorphic area I has approximately 2,400 acres in poor condition. It was projected that by applying the grazing treatments proposed in Alternative A, the sediment yield from those 2,400 acres would shift from the high end to the middle of the range. Multiplying that yield by the number of acres involved, resulted in an amount of sediment produced per year from those acres

This method was applied to each of the treatments in each alternative, resulting in the Summary of Watershed Impacts found at the end of the discussion of each alternative in chapter four.

Water yields were estimated using mean annual runoff curves from small watersheds for eastern and central Montana developed by BLM hydrologists at the Lewistown District Office. It was assumed that water yields varied directly with sediment yields. Therefore, the same methods used to predict sediment yields were also used to predict water yields

APPENDIX 4.3: PROGRAMMATIC MEMORANDUM OF AGREEMENT

Advisory
Council On
Historic
Preservation

1522 K Street N.W.
Washington D.C.
20005

PROGRAMMATIC MEMORANDUM OF AGREEMENT
BETWEEN THE
DEPARTMENT OF THE INTERIOR, BUREAU OF LAND MANAGEMENT,
THE ADVISORY COUNCIL ON HISTORIC PRESERVATION,
AND THE
NATIONAL CONFERENCE OF STATE HISTORIC PRESERVATION OFFICERS
REGARDING THE
LIVESTOCK GRAZING AND RANGE IMPROVEMENT PROGRAM

WHEREAS, the Department of the Interior, Bureau of Land Management, administers public lands, principally in the 11 Western States and Alaska, under concepts of multiple-use and sustained yield, and, among other responsibilities, the Bureau of Land Management is charged with management of rangeland and forage products under the Taylor Grazing Act of 1934 (43 U.S.C. 315) and the Federal Land Policy and Management Act of 1976 (43 U.S.C. 1701), which also charges the Bureau of Land Management with the management and protection of cultural resources; and

WHEREAS, Section 106 of the National Historic Preservation Act (16 U.S.C. 470f, as amended, 90 Stat. 1320) requires that the head of any Federal agency having direct or indirect jurisdiction over a proposed Federal, federally assisted, or federally licensed undertaking affecting properties in or eligible for the National Register of Historic Places shall afford the Advisory Council on Historic Preservation (hereafter Council) a reasonable opportunity for comment; and

WHEREAS, livestock grazing and range improvement activities undertaken by the Bureau of Land Management may have an effect upon properties in or eligible for the National Register of Historic Places and will require compliance with Section 106 of the National Historic Preservation Act, Section 2 of Executive Order 11593, May 13, 1971, "Protection and Enhancement of the Cultural Environment," and the Council's regulations, "Protection of Historic and Cultural Properties" (36 CFR Part 800); and

WHEREAS, the Bureau of Land Management is currently engaged in an ongoing program of rangeland management which involves the preparation, by 1988, of approximately 145 environmental statements on specific areas where grazing is permitted on approximately

174 million acres of public lands in the Western States and has requested Council review of the rangeland management program; and

WHEREAS, the Council and the Bureau of Land Management have met and reviewed the livestock grazing and range improvement program of the Bureau of Land Management and its relation to compliance with Section 106 of the National Historic Preservation Act of 1966 and Executive Order 11593, as implemented by the Council's regulations (36 CFR Part 800) and the responsibilities for historic and cultural resources under the National Environmental Policy Act of 1969 (42 U.S.C. 4321) as implemented by the Council on Environmental Quality in the "National Environmental Policy Act Regulations" (40 CFR Parts 1500-1508).

NOW, THEREFORE, it is mutually agreed that the Bureau of Land Management will ensure, through the stipulations outlined in this Programmatic Memorandum of Agreement, that historic and cultural properties will be given adequate consideration in grazing management program decisions and implementation which includes, but is not limited to, the preparation of grazing environmental statements, thereby meeting its responsibilities under Section 106 of the National Historic Preservation Act.

STIPULATIONS

1. The Bureau of Land Management will conduct Class I (existing data inventory) and Class II (sampling field inventory) inventories of historic and cultural properties, as specified in BLM Manual Section 8111, to be completed at the appropriate planning stage and prior to the preparation of the draft environmental statement. Inventory results will be evaluated, in consultation with the appropriate State Historic Preservation Officer, to identify properties included in or eligible for inclusion in the National Register of Historic Places.

   a. The inventory requirement may be modified on a case by case basis for interim grazing environmental statements (i.e., those prepared during fiscal years 1979 through 1981) if an alternative is acceptable to the appropriate State Historic Preservation Officer.

b. If an acceptable alternative cannot be negotiated with the appropriate State Historic Preservation Officer, then the Bureau of Land Management will proceed with the preparation of the environmental statement and request the comments of the Council in accordance with 36 CFR 800. The Council's comments will be included in the final environmental statement.

2. This Programmatic Memorandum of Agreement and the inventory reports identifying historic and cultural properties will be referenced in each environmental statement.

3. Prior to commencement of any range improvement activities which involve land disturbance, the Bureau of Land Management will conduct a Class III inventory, as specified in the BLM Manual Section 8111.4, supplementing previous surveys to locate, identify, and evaluate properties in the impact area that may be eligible for inclusion in the National Register of Historic Places. Range improvement activities which involve land disturbance include, but are not limited to, such activities as construction of fencing and corrals, water development, chaining, and controlled burning. If properties that may be eligible for the National Register are found, the Bureau of Land Management will consult with the appropriate State Historic Preservation Officer and forward the documentation to the Keeper of the National Register to obtain a determination of eligibility in accordance with 36 CFR Part 63.

4. The Bureau of Land Management will provide the appropriate State Historic Preservation Officer with copies of the reports of the Class I, II, and III inventories in accordance with Sections 102(a)(2) and 202(c)(9) of the Federal Land Policy and Management Act of 1976 for inclusion as part of the State inventory conducted pursuant to 36 CFR Part 61.

5. The Bureau of Land Management will design the livestock grazing and range improvement program to avoid adverse effects on properties included in or eligible for inclusion in the National Register of Historic Places, unless this is not prudent or feasible.

6. Where it is not prudent or feasible to avoid adverse effects on properties included in or eligible for inclusion in the National Register of Historic Places as part of a livestock grazing and range improvement program authorization and the property is not a National Historic Landmark or National Historic Site, the Bureau of Land Management will consult with the appropriate State Historic Preservation Officer and will:

   a. Develop mutually acceptable measures to mitigate the impact of the proposed action; and

   b. Notify the Council in writing of agreements reached with the State Historic Preservation Officer under the provisions of 6(a) above. The Council need not be afforded further opportunity for review and comment.

7. The provisions of this Programmatic Memorandum of Agreement shall apply to the States of Arizona, California, Colorado, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming.

8. If it is determined that the affected property is a National Historic Landmark or National Historic Site, or agreement cannot be reached between the Bureau of Land Management and the appropriate State Historic Preservation Officer on satisfactory mitigation measures, the Bureau of Land Management will request the comments of the Council in accordance with 36 CFR Part 800.

9. At the request of the President or a Member of Congress, the Council may advise the Bureau of Land Management, that a particular action, authorized by a grazing permit or lease, will require individual review and comment pursuant to 36 CFR Part 800. In that event, the Bureau of Land Management will comply with the provisions of the Council's regulations.

10. The Council and the Bureau of Land Management will review the provisions of this Agreement on an annual basis to determine whether modification or termination is appropriate. Should the current livestock grazing program of the Bureau of Land Management be revised, the ratifying parties will mutually determine whether the provisions of the Agreement will continue to apply.

Robert M. Utley 8/20/79
Deputy Executive Director (date)
Advisory Council on Historic
Preservation

Associate Ed Hastey 12/31/79
Director, Bureau of Land Management (date)

Larry E Linn 8/26/79
President, National Conference of (date)
State Historic Preservation Officers

Richard T. Jenkins 1/14/80
Chairman (date)
Advisory Council on Historic
Preservation

APPENDIX 4.4: ESTIMATED POSITIVE LONG-TERM IMPACTS OF ALTERNATIVE A ON NET ANNUAL RANCH INCOME ON AFFECTED RANCHES

	Size By Number of Brood Cows	Average Number of Brood Cows	Number of Ranches	Average Increase in Public AUMs Per Ranch	Average Percent Increase in Public AUMs Per Ranch	Average Percent Increase in Total AUMs Per Ranch	Increased Annual Income		
							Average Per Ranch	Percentage Per Ranch	All Ranches
Small Livestock Small Cash Crop	0-150	100	77	29	16.2	3.9	454	6.7	34,936
Small Livestock Medium Cash Crop	0-150	100	75	29	16.1	3.8	452	3.0	33,872
Small Livestock Large Cash Crop	0-150	100	22	32	18.0	5.6	505	1.3	11,116
Medium Livestock Small Cash Crop	151-374	250	52	36	9.1	1.4	568	3.8	29,511
Medium Livestock Medium Cash Crop	151-374	250	36	44	11.2	2.2	697	3.0	25,075
Medium Livestock Large Cash Crop	151-374	250	19	46	11.5	1.0	718	1.4	13,638
Large Livestock Small Cash Crop	375-749	500	36	51	10.0	1.6	795	3.0	28,603
Large Livestock Medium Cash Crop	375-749	500	10	90	17.7	2.5	1408	4.1	14,081
Large Livestock Large Cash Crop	375-749	500	4	10	2.0	0.1	157	0.2	629
Very Large Livestock Small Cash Crop	750 or more	1500	14	122	8.5	2.6	895	1.7	12,527
Very Large Livestock Medium Cash Crop	750 or more	1500	4	28	1.9	0.3	202	0.3	807
Very Large Livestock Large Cash Crop	750 or more	1500	1	115	8.0	1.7	843	0.9	843
TOTAL			350						205,638

Source: BLM 1981

APPENDIX 4.5: ANNUAL ECONOMIC IMPACT OF ALTERNATIVE A ON THE STUDY AREA

	Agriculture	Government	Services[8]	Trade[8]	Construction	Total	Pct of 1978 Total
Existing Situation (1978)[1]							
Earnings ($1,000)	26,600	22,414	16,942	16,787	13,318	174,888[9]	100
Employment	3,456[7]	2,818	2,097	2,159	824	17,631[9]	100
Short-Term Changes[2]							
Sales[4] ($,1000)	0	-	0	0	1,833	-	-
Gross Output[4] ($1,000)	0	-	0	0	3,652	-	-
Earnings[4] ($1,000)	0	558[10]	0	0	1,077	1635[11]	0.9
Employment[3]	0	25[10]	0	0	109	134[11]	0.8
Long-Term Changes[2]							
Sales[6] ($1,000)	0	-	0	0	0	-	-
Gross Output[6] ($1,000)	0	-	0	0	0	-	-
Earnings[6] ($1,000)	0	0[10]	0	0	0	0[11]	0
Employment[5]	0	0[10]	0	0	0	0[11]	0

1. Figures for existing situation indicate employment and earnings within the itemized sectors for 1978.

2. Figures for short-term and long-term changes indicate direct and indirect output, earnings and employment generated by the change in sales for the itemized sector (except for government section, see #10).

3. The short-term changes for employment indicate the total change from existing situation during the first 5 years of implementation.

4. The short-term changes for output, earnings and employment indicate the average annual change from the existing situation during the first 5 years of implementation.

5. Long-term changes for employment indicate the total change from the existing situation during the 10 years of implementation following the first 5 years.

6. Long-term changes for output, earnings and employment indicate the average annual change from the existing situation during the 10 years of implementation following the first 5 years.

7. Includes wage and salary and proprietory employment.

8. Recreation expenditures are divided into the service and trade sectors. The changes are displayed as zero, because no quantitative changes in wildlife population are specified.

9. This is the total listed for all sectors in Tables 3-12 and 3-13.

10. This is only the direct change associated with government earnings and employment.

11. Total for changes in agriculture, construction, services, trade and government.

SOURCE: BLM 1981

APPENDIX 4.6: ESTIMATED NEGATIVE SHORT-TERM IMPACTS OF ALTERNATIVE B ON NET ANNUAL RANCH INCOME ON AFFECTED RANCHES

	Size By Number of Brood Cows	Average Number of Brood Cows	Number of Ranches	Average Decrease in Public AUMs Per Ranch	Average Percent Decrease in Public AUMs Per Ranch	Average Percent Decrease in Total AUMs Per Ranch	Decreased Annual Income		
							Average Per Ranch	Percentage Per Ranch	All Ranches
Small Livestock Small Cash Crop	0-150	100	89	56	31.3	7.6	814	11.9	72,415
Small Livestock Medium Cash Crop	0-150	100	82	43	23.7	5.5	618	4.0	50,638
Small Livestock Large Cash Crop	0-150	100	29	40	22.5	7.0	588	1.5	17,046
Medium Livestock Small Cash Crop	151-374	250	70	94	23.7	3.6	1471	9.8	102,997
Medium Livestock Medium Cash Crop	151-374	250	41	120	30.3	5.9	1874	8.1	76,836
Medium Livestock Large Cash Crop	151-374	250	19	60	15.1	1.4	937	1.8	17,805
Large Livestock Small Cash Crop	375-749	500	41	177	35.0	5.5	2770	10.5	113,571
Large Livestock Medium Cash Crop	375-749	500	16	194	23.3	3.4	3026	8.8	48,410
Large Livestock Large Cash Crop	375-749	500	6	122	24.1	0.1	1902	2.5	11,412
Very Large Livestock Small Cash Crop	750 or more	1500	21	482	33.6	10.1	3434	6.4	72,123
Very Large Livestock Medium Cash Crop	750 or more	1500	2	258	18.0	2.9	1852	3.1	3,705
Very Large Livestock Large Cash Crop	750 or more	1500	2	164	11.4	2.5	1174	1.2	2,348
TOTAL			418						589,306

Source: BLM 1981

APPENDIX 4.7: ESTIMATED POSITIVE LONG-TERM IMPACTS OF ALTERNATIVE B ON NET ANNUAL RANCH INCOME ON AFFECTED RANCHES

	Size By Number of Brood Cows	Average Number of Brood Cows	Number of Ranches	Average Increase in Public AUMs Per Ranch	Average Percent Increase in Public AUMs Per Ranch	Average Percent Increase in Total AUMs Per Ranch	Increased Annual Income		
							Average Per Ranch	Percentage Per Ranch	All Ranches
Small Livestock Small Cash Crop	0-150	100	44	28	15.7	3.8	440	6.5	19,366
Small Livestock Medium Cash Crop	0-150	100	48	28	15.4	3.6	431	2.8	20,678
Small Livestock Large Cash Crop	0-150	100	12	29	16.3	5.1	459	1.2	5,502
Medium Livestock Small Cash Crop	151-374	250	22	34	8.6	1.3	533	3.6	11,735
Medium Livestock Medium Cash Crop	151-374	250	21	56	14.2	2.8	885	3.8	18,593
Medium Livestock Large Cash Crop	151-374	250	10	51	12.9	1.2	805	1.5	8,054
Large Livestock Small Cash Crop	375-749	500	12	26	5.1	0.8	408	1.5	4,893
Large Livestock Medium Cash Crop	375-749	500	3	25	4.9	0.7	388	1.1	1,164
Large Livestock Large Cash Crop	375-749	500	0	0	-	-	-	-	0
Very Large Livestock Small Cash Crop	750 or more	1500	2	23	1.6	0.5	165	0.3	330
Very Large Livestock Medium Cash Crop	750 or more	1500	2	43	3.0	0.5	312	0.5	623
Very Large Livestock Large Cash Crop	750 or more	1500	0	0	-	-	-	-	0
TOTAL			176						90,938

Source: BLM 1981

APPENDIX 4.8: ESTIMATED NEGATIVE LONG-TERM IMPACTS OF ALTERNATIVE B ON NET ANNUAL RANCH INCOME ON AFFECTED RANCHES

	Size By Number of Brood Cows	Average Number of Brood Cows	Number of Ranches	Average Decrease in Public AUMs Per Ranch	Average Percent Decrease in Public AUMs Per Ranch	Average Percent Decrease in Total AUMs Per Ranch	Decreased Annual Income		
							Average Per Ranch	Percentage Per Ranch	All Ranches
Small Livestock Small Cash Crop	0-150	100	73	56	31.3	7.6	814	12.0	59,449
Small Livestock Medium Cash Crop	0-150	100	58	45	25.2	5.9	656	4.3	38,055
Small Livestock Large Cash Crop	0-150	100	22	42	23.6	7.3	616	1.5	13,542
Medium Livestock Small Cash Crop	151-374	250	56	97	24.5	3.7	1520	10.1	85,135
Medium Livestock Medium Cash Crop	151-374	250	32	129	32.7	6.4	2017	8.7	64,535
Medium Livestock Large Cash Crop	151-374	250	14	55	13.7	1.2	853	1.6	11,946
Large Livestock Small Cash Crop	375-749	500	36	168	33.2	5.2	2625	9.9	94,500
Large Livestock Medium Cash Crop	375-749	500	14	163	32.2	4.6	2552	7.4	35,727
Large Livestock Large Cash Crop	375-749	500	6	115	22.7	0.9	1798	2.4	10,785
Very Large Livestock Small Cash Crop	750 or more	1500	20	443	30.8	9.3	3158	5.9	63,166
Very Large Livestock Medium Cash Crop	750 or more	1500	2	246	17.1	2.7	1763	3.0	3,525
Very Large Livestock Large Cash Crop	750 or more	1500	2	75	5.2	1.1	535	0.5	1,070
TOTAL			335						481,435

Source: BLM 1981

APPENDIX 4.9: ANNUAL ECONOMIC IMPACT OF ALTERNATIVE B ON THE STUDY AREA

	Agriculture	Government	Services[8]	Trade[8]	Construction	Total	Pct of 1978 Total
Existing Situation (1978)[1]							
Earnings ($1,000)	26,600	22,414	16,942	16,787	13,318	174,888	100
Employment	3,456[7]	2,818	2,097	2,159	824	17,631[9]	100
Short-Term Changes[2]							
Sales[4] ($,1000)	- 438	-	0	0	1,833	-	-
Gross Output[4] ($1,000)	-1,131	-	0	0	3,652	-	-
Earnings[4] ($1,000)	- 277	558[10]	0	0	1,077	1358[11]	0.8
Employment[3]	- 28	25[10]	0	0	109	106[11]	0.6
Long-Term Changes[2]							
Sales[6] ($1,000)	- 368	-	0	0	0	-	-
Gross Output[6] ($1,000)	- 950	-	0	0	0	-	-
Earnings[6] ($1,000)	- 231	0[10]	0	0	0	-231[11]	0.1
Employment[5]	- 23	0[10]	0	0	0	-23[11]	0.1

1. Figures for existing situation indicate employment and earnings within the itemized sectors for 1978.

2. Figures for short-term and long-term changes indicate direct and indirect output, earnings and employment generated by the change in sales for the itemized sector (except for government section, see #10).

3. The short-term changes for employment indicate the total change from existing situation during the first 5 years of implementation.

4. The short-term changes for output, earnings and employment indicate the average annual change from the existing situation during the first 5 years of implementation.

5. Long-term changes for employment indicate the total change from the existing situation during the 10 years of implementation following the first 5 years.

6. Long-term changes for output, earnings and employment indicate the average annual change from the existing situation during the 10 years of implementation following the first 5 years.

7. Includes wage and salary and proprietory employment.

8. Recreation expenditures are divided into the service and trade sectors. The changes are displayed as zero, because no quantitative changes in wildlife population are specified.

9. This is the total listed for all sectors in Tables 3-12 and 3-13.

10. This is only the direct change associated with government earnings and employment.

11. Total for changes in agriculture, construction, services, trade and government.

SOURCE: BLM 1981

APPENDIX 4.10: ESTIMATED NEGATIVE LONG AND SHORT-TERM IMPACTS OF ALTERNATIVE C ON NET ANNUAL RANCH INCOME ON AFFECTED RANCHES

	Size By Number of Brood Cows	Average Number of Brood Cows	Number of Ranches	Average Decrease In Public AUMs Per Ranch	Average Percent Decrease in Public AUMs Per Ranch	Average Percent Decrease in Total AUMs Per Ranch	Decreased Annual Income		
							Average Per Ranch	Percentage Per Ranch	All Ranches
Small Livestock Small Cash Crop	0-150	100	140	179	100	24.8	2,596	38	363,486
Small Livestock Medium Cash Crop	0-150	100	124	179	100	24.8	2,596	17	321,945
Small Livestock Large Cash Crop	0-150	100	36	179	100	24.8	2,596	7	93,468
Medium Livestock Small Cash Crop	151-374	250	104	396	100	15.7	5,852	39	608,565
Medium Livestock Medium Cash Crop	151-374	250	62	396	100	15.7	5,852	25	362,798
Medium Livestock Large Cash Crop	151-374	250	27	396	100	15.7	5,852	11	157,993
Large Livestock Small Cash Crop	375-749	500	58	830	100	14.5	12,183	46	706,599
Large Livestock Medium Cash Crop	375-749	500	17	830	100	14.5	12,183	35	207,107
Large Livestock Large Cash Crop	375-749	500	6	830	100	14.5	12,183	16	73,096
Very Large Livestock Small Cash Crop	750 or more	1,500	29	1,435	100	12.9	9,606	18	278,580
Very Large Livestock Medium Cash Crop	750 or more	1,500	3	1,435	100	12.9	9,606	16	28,819
Very Large Livestock Large Cash Crop	750 or more	1,500	2	1,435	100	12.9	9,606	10	19,212
TOTAL			608						3,221,668

Source: BLM 1981

APPENDIX 4.11: ANNUAL ECONOMIC IMPACT OF ALTERNATIVE C ON THE STUDY AREA

	Agriculture	Government	Services[8]	Trade[8]	Construction	Total	Pct of 1978 Total
Existing Situation (1978)[1]							
Earnings ($1,000)	26,600	22,414	16,942	16,787	13,318	174,888[9]	100
Employment	3,456[7]	2,818	2,097	2,159	824	17,631[9]	100
Short-Term Changes[2]							
Sales[4] ($,1000)	- 4,759	-	0	0	3,992	-	-
Gross Output[4] ($1,000)	- 12,282	-	0	0	7,952	-	-
Earnings[4] ($1,000)	- 3,009	162[10]	0	0	2,346	-501[11]	0.3
Employment[3]	- 303	7[10]	0	0	236	-60[11]	0.3
Long-Term Changes[2]							
Sales[6] ($1,000)	- 4,759	-	0	0	0	-	-
Gross Output[6] ($1,000)	- 12,282	-	0	0	0	-	-
Earnings[6] ($1,000)	- 3,009	0[10]	0	0	0	-3009[11]	1.7
Employment[5]	- 303	0[10]	0	0	0	-303[11]	1.7

1. Figures for existing situation indicate employment and earnings within the itemized sectors for 1978.

2. Figures for short-term and long-term changes indicate direct and indirect output, earnings and employment generated by the change in sales for the itemized sector (except for government section, see #10).

3. The short-term changes for employment indicate the total change from existing situation during the first 5 years of implementation.

4. The short-term changes for output, earnings and employment indicate the average annual change from the existing situation during the first 5 years of implementation.

5. Long-term changes for employment indicate the total change from the existing situation during the 10 years of implementation following the first 5 years.

6. Long-term changes for output, earnings and employment indicate the average annual change from the existing situation during the 10 years of implementation following the first 5 years.

7. Includes wage and salary and proprietory employment.

8. Recreation expenditures are divided into the service and trade sectors. The changes are displayed as zero, because no quantitative changes in wildlife population are specified.

9. This is the total listed for all sectors in Tables 3.12 and 3.13.

10. This is only the direct change associated with government earnings and employment.

11. Total for changes in agriculture, construction, services, trade and government.

SOURCE: BLM 1981

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GLOSSARY

ACCELERATED EROSION. Erosion processes increased by the activities of man. See "Erosion."

ACID SOIL. Soil with a pH value less than 6.6.

ACRE-FOOT. A unit for measuring volume, equal to the quantity of water or other material required to cover 1 acre to a depth of 1 foot or a volume of 43,560 cubic feet.

ACTUAL USE. (1) The actual amount of grazing by livestock and/or game animals (2) The index of actual use submitted by livestock operators (#'s, class of stock, season) expressed in AUM's.

ADJUSTMENTS. Changes in animal numbers, seasons of use, kinds or class of animals or management practices as warranted by specific condition.

ALKALINE SOIL. A soil that is alkaline throughout most or all of the parts occupied by plant roots. It is any soil horizon having a pH value greater than 7.3.

ALLOTMENT. An area of land where livestock operators graze their livestock.

ALLOTMENT MANAGEMENT PLAN (AMP). A written program of livestock grazing management, including supportive measures if required, designed to attain specific management goals in a grazing allotment.

ALLOWABLE USE. The amount of use the various plant species can withstand and still maintain their vigor and reproductive capabilities.

ALLUVIAL SOIL. A soil developing from recently deposited alluvium and showing essentially no development of layers or modification of the recently deposited materials.

ALLUVIUM. Soil and rock debris deposited by streams.

ANIMAL UNIT (AU). Considered to be mature (1000 lb) cow or the equivalent, based on an average consumption of 26 lbs of dry forage per day (800 lb/month).

ANIMAL UNIT MONTH (AUM). (1) The amount of forage necessary for sustenance of one animal unit for one month; (2) The measurement of the privilege of grazing one animal unit for one month.

APPRECIATION. Increase in cost, price or value over the cost, price or value from a previous time or period.

AQUATIC. Living or growing in or on the water.

AQUIFER. A rock formation, group of rock formations or part of a rock formation that contains enough water-saturated permeable material to yield water to a spring or well.

ASPECT. The orientation of a slope with respect to the compass; a position facing or fronting a particular direction; also, the visual first impression of vegetation at a particular time or as seen from a specific point.

AVAILABLE WATER CAPACITY. The portion of water in a soil that can readily be absorbed by plant roots. It is rated on soil characteristics that influence the ability of the soil to hold water such as content of organic matter, soil texture and soil structure.

AWNS. A slender bristle found at the tips of the spikelets in many grasses.

BEDROCK. The solid unweathered rock underlying soils.

BROWSE. To browse is to graze a plant; also, browse (noun) is the tender shoots, twigs and leaves of trees and shrubs often used as food by cattle, deer, elk and other animals.

BUFFER ZONE/BUFFER STRIP. Area of land adjacent to a body of water which filters sediment from overland runoff and has a stabilizing influence on the bank or shoreline.

BULK DENSITY (SOIL). The mass of dry soil per unit of bulk volume.

CALCAREOUS SOIL. Soil containing sufficient free calcium carbonate or calcium magnesium carbonate to effervesce visibly when treated with cold hydrochloric acid.

CALF CROP. The number of calves weaned from a given number of cows bred, usually expressed in percentages.

CANOPY COVER. The percentage of ground covered when a polygon drawn around the extremities of the undisturbed canopy of each plant is projected on the ground and all such projections on a given area are added together.

CHANNEL. An open conduit either naturally or artificially created which periodically or continuously contains moving water or forms a connecting link between two bodies of water.

CHANNEL STABILITY. A relative term describing erosion or movement of the channel walls or bottom due to water flow.

CHARACTERISTIC LANDSCAPE. The established landscape in an area, not necessarily a natural area. It could refer to a farming community, urban area or any other landscape which has an identifiable character.

CHISELING. Shallow tillage of the range to speed range improvement by increasing infiltration and reducing competition to desirable species from a dense stand of less desirable vegetation.

CLAYEY. A soil containing more than 35% clay. The textural classes are sandy clay, silty clay, clay, clay loam and silty clay loam.

CLAYPAN. A dense, compact layer in the subsoil having a much higher clay content than the overlying material from which it is separated by a sharply defined boundary.

CLIMAX. The highest ecological development of a plant community capable of perpetuation under the prevailing climatic and soil conditions.

COMPACTION. The process of packing firmly and closely together; the state of being so packed, e.g., mechanical compaction of soil by livestock or vehicular activity. Soil compaction results from particles being pressed together so that the volume of the soil is reduced. It is influenced by the physical properties of the soil, moisture content and the type and amount of compactive effort.

CONTRAST. The effect of a change in the form, line, color or texture of an existing landscape resulting from the addition of a manmade feature.

CONTOUR FURROW. A plowed strip on the contour of the land for water retention.

COW CALF OPERATION. A livestock operation in which a basic breeding herd of cows, heifers and bulls is maintained. The cows produce a calf crop each year and the operation keeps some heifer calves from each crop for breeding herd replacements. The operation sells the rest of the calf crop between the ages of 6-12 months along with old or non-productive cows and bulls.

CRUCIAL BIG GAME WINTER RANGE. Observation(s) of 5 or more animals per square mile.

CRUCIAL WILDLIFE HABITAT. Parts of the habitat necessary to sustain a wildlife population at critical periods of its life cycle. This is often a limiting factor on the population, such as breeding habitat, winter habitat, etc.

CULTURAL RESOURCES. A term that includes items of historical, archaeological or architectural significance which are fragile, limited and non-renewable portions of the human environment.

CULTURAL SITE. Any location that includes prehistoric and/or historic evidence of human use.

DEFERMENT. The withholding of livestock grazing to provide for plant reproduction, establishment, or vigor recovery.

DEFERRED GRAZING. The use of deferment in grazing management.

DEFERRED ROTATION GRAZING. Deferment of livestock grazing on various parts of a range in succeeding years; systematic rotation of grazing deferment among pastures.

DEPRECIATION. As used in this EIS, depreciation is the annual expense incurred in writing off costs of depreciable assets over their useful life.

DETENTION DAM. A dam constructed for the temporary storage of flood flows where the release opening is of fixed capacity and is not manually operated.

DIET OVERLAP. The presence of the same forage plant in the diet of several herbivores.

DIRECT INCOME. Income coming from a specific source.

DISCLIMAX. A relatively stable ecological community which displaces the climax because of a disturbance.

DISTRIBUTION. The uniformity of livestock grazing over a range area. Distribution is affected by the availability of water, topography and type and palatability of vegetation as well as other factors.

DRAINAGE (INTERNAL SOIL). The property of a soil that permits the downward flow of excess water. Drainage is reflected in the number of times and in the length of time water stays in the soil. It is influenced by the physical characteristics of the soil profile, the underlying layers and the depth of the water table.

DRAINAGE CLASSES (OF SOILS).

"Very Poorly Drained." Water is removed from the soil so slowly that free water remains at or near the surface during most of the growing season. Soils of this drainage class occupy level or depressed sites and are frequently ponded.

"Poorly Drained." Water is removed from the soil so slowly that the soil remains wet and the water table remains near the surface during a large part of the year.

"Somewhat Poorly Drained." Water is removed from the soil slowly enough to keep the soil wet for significant periods during the growing season.

"Moderately Well-Drained." Water is removed from the soil somewhat slowly during some periods. The soil is wet for a small part of the growing season.

"Well-Drained." Water is removed from the soil readily but not rapidly. Water is available for plant growth through most of the growing season and wetness does not inhibit growth of roots.

"Somewhat Excessively Drained." Water is removed from the soil rapidly. Soils may be shallow or sandy and rapidly pervious. Some are so steep that much of the water they receive is lost in runoff.

"Excessively Drained." Water is removed from the soil very rapidly. These soils are commonly coarse textured, rocky, shallow or steep.

ECOLOGICAL RANGE CONDITION CLASSES. Four classes used to express the degree to which the composition of the present plant community reflects that of climax. They are:

"Condition Class"	Percentage
Excellent	76-100
Good	51-75
Fair	26-50
Poor	0-25

ECOSYSTEM. An ecological community together with its physical environment. Its functioning involves the circulation of matter and energy between organisms and their environment.

EDGE. A diversity of habitats available in a relatively small area, i.e. where habitats "edge" into one another.

ELIMINATION OF GRAZING. Relinquishment or cancellation of livestock grazing on public lands currently being grazed by livestock.

ENDANGERED OR THREATENED SPECIES.

Determined for plants and animals by one or a combination of the following factors:

1. The present or threatened destruction, modification or curtailments of a species habitat or range.
2. Over utilization of a species for commercial, sporting, scientific or education purposes.
3. Disease or predation of the species.
4. The inadequacy of existing regulatory mechanisms.
5. Other natural or human caused factors affecting a species' continued existence.

ENVIRONMENTAL IMPACT STATEMENT (EIS). A written analysis of the impacts on the environment of a proposed action.

EPHEMERAL STREAM. A stream that flows only after rains or during snowmelt.

EQUITY CAPITAL INVESTMENT. The net value of a ranch property obtained by subtracting from its total value the amount owed on it.

EROSION. The wearing away of the land surface by running water, wind, ice or other geological agents.

EROSION CONDITION CLASSES. Expression of current erosion activity by use of the following ratings (soil surface factor): stable, 0-20; slight, 21-40; moderate, 41-60; critical, 61-80; severe, 81-100.

EROSION SUSCEPTIBILITY. The susceptibility of a soil to erosion when no cover is present. The rate of soil displacement depends on the physical properties of the soil, rainfall intensity and slope gradient.

EXPOSURE. Direction of a slope in respect to points of the compass.

FECAL COLIFORM. Bacteria that are present in the intestine and feces of warm blooded animals. Their presence in water indicates fecal contaimination.

FEDERAL LAND POLICY AND MANAGEMENT ACT OF 1976 (FLPMA). Public Law 94-579, October 21, 1976, often referred to as the BLMs "Organic Act," which provides the majority of the BLM's legislated authority, direction, policy and basic management guidance.

FLOODPLAIN. The relatively flat area or lowland adjoining a drainage.

FORB. A broadleafed herb that is not grass, sedge or rush.

FRIABLE. A soil with a loose surface that is easily crumbled or pulverized.

GEOMORPHIC. Pertaining to the form of the earth or its surface features.

GEOMORPHIC SOIL SUBGROUP. A group of soils having a unique kind and degree of limitation for alternative land use and treatment based on parent material, soil quality and landscape features.

GLACIAL TILL. Unstratified glacial drift deposited directly by the ice consisting of clay, silt, sand, gravel and boulders intermingled in any proportion.

GRANDFATHERED ACTIVITY. For wilderness purposes, any land surface disturbance or alteration that had occurred within a Wilderness Study Area prior to the passage of FLPMA (October 21, 1976).

GRAZING DISTRICT. Established by the Taylor Grazing Act, grazing districts are administrative subdivisions of the rangelands under jurisdiction of the BLM.

GRAZING SYSTEM. The manipulation of livestock grazing to accomplish a desired result.

GROUND COVER. Vegetation, mulch, litter, rocks, etc.

GROUNDWATER. Water contained in pore spaces of consolidated and unconsolidated subsurface material.

GULLYING. The erosion process whereby water accumulates in narrow channels and, over short periods, removes the soil from this narrow area to considerable depths, ranging from 0.5 meter (1.6 feet) to as much as 25 to 30 meters (83 to 100 feet).

HABITAT. A specific set of physical conditions that surround a species, group of species or a large community. In wildlife management, the major constituents of habitat are considered to be food, water, cover and living space.

HYDROLOGIC GEOMORPHIC AREAS.

Rolling Plains: Soils sedimentary in origin with loamy and sandy textures. Vegetation is grassland (short and midgrasses). In the Big Dry Resource Area, all soil series described by soil subgroups 3, 4, 7, 8 and 12 commonly occur in these watersheds.

Glaciated Plains: Soils are complex and derived from glacial till, sedimentary bedrock and allivium from mixed rock sources. Within these complexes, soils have loamy textures, and claypan to dense clay textures. Vegetation is grassland—sagebrush type (short to midgrasses). In the Big Dry Resource Area, all soil series described by soil subgroups 5, 6 and 10 commonly occur in these watersheds.

Rolling Plains: Soils are sedimentary in origin, and have clayey and loamy textures. Vegetation is grassland, sagebrush, and juniper. In the Big Dry Resource Area, all soil series described by soil subgroups 1, 9, 11 and 13 commonly occur in these watersheds.

River Breaks: These geomorphic areas are confined to lands adjacent to the Missouri, Musselshell, Powder and Yellowstone Rivers, including some major tributaries to these rivers. Soil textures are clayey and shallow soils are common. Vegetative types most represented are grassland, sagebrush, juniper, and ponderosa pine. In the Big Dry Resource Area, all soil series described by soil subgroups 14 and 15 commonly occur in these watersheds.

HYDROLOGY. The science dealing with the behavior of water as it occurs in the atmosphere, on the surface of the ground and underground.

INDIRECT BUSINESS ACTIVITY. Total income produced in other economic sectors (such as in retail trade) by the receipt of income in a different sector (such as in the livestock industry).

INDUSTRY INCOME MULTIPLIER. An indicator of the income stimulated from the regional economy by an economic sector (e.g. government, agriculture) above and beyond the initial income produced by that sector.

INFILTRATION. The penetration of water into the soil surface through pores of the soil. The rate and amount of infilitration is limited by the size and abundance of pores, organic matter content and the water absorption capacity of the soil.

INFILTRATION CAPACITY. The maximum rate at which the soil, when in a given condition, can absorb falling rain or melting snow.

INTERIM MANAGEMENT POLICY AND GUIDELINES FOR LANDS UNDER WILDERNESS REVIEW (IMP). A BLM document, dated December 12, 1979, which defines the policy for management of Wilderness Study Areas until a final determination on Wilderness designation is made by Congress.

INTERMITTENT STREAM. A stream which flows most of the time but ocassionally is dry or reduced to pool stage.

INTERSEEDING. The practice of seeding native or introduced plant species into native range in combination with various mechanical treatments. Interseeding differs from range seeding in that only part of the native vegetation is removed to provide a seed bed for the seeded species.

KEY SPECIES. Major forage species on which range management should be based.

LAND CAPABILITY CLASS (LCC). A soil conservation service system where land is classified according to a suitable sustained use that can be made of it while providing for adequate protection from erosion or other means of deterioration.

LANDSCAPE. All natural features such as fields, hills, forests, etc., which distinguish one part of the earth's surface from another part.

LAND TREATMENT. All methods of artificial range/soil improvement and stabilization such as reseeding, brush control (chemical and mechanical), pitting, furrowing, waterspreading, prescribed fire, etc.

LEASE (GRAZING). A document authorizing use of the public lands outside grazing districts under section 15 of the Taylor Grazing Act for grazing livestock.

LIVESTOCK OPERATION. The management of a ranch or farm so that a significant portion of the income is derived from the continuing production of livestock.

LOAMY. Soil that is intermediate in texture and properties between sandy and clayey soils. Textural classes are sandy loam, fine sandy loam, very fine sandy loam, loam, silt liam, silt, sandy clay loam, and clay loam with clay content between 18 and 35 percent.

MANAGEMENT FRAMEWORK PLAN (MFP). A planning decision document that establishes, for a given planning area, land use allocations, coordination guidelines for multiple use, and management objectives to be achieved for each class of land use or protection. It is the BLM's land use plan. An MFP is prepared in three steps: (1) resource recommendations, (2) impact analysis and alternative development, and (3) decision making.

MECHANICAL TREATMENTS. Treatment by mechanical means of an area of range including contour furrowing, pitting, plowing and seeding, chiseling, scalping, water spreaders, etc.

MITIGATION MEASURES. Methods or procedures committed to by BLM for the purpose of reducing or lessening the impacts of an action.

MULTIPLE USE. Balanced management of the various surface and subsurface resources, without permanent impairment of the productivity of the land, that will best meet present and future needs.

NET RANCH INCOME. The personal income available to the operator and his family for their labor and management and the return to their equity capital investment. Net ranch income is figured as the gross cash receipts of the ranch minus cash operating expenses and depreciation.

NONCONSUMPTIVE USES. Those uses of public lands which no actual utilization of vegetation occurs. These uses consist of watershed, nonconsumptive recreation, esthetics, etc.

NONUSE. Grazing capacity which is not licensed during a given time period.

NUTRIENT LOADING. A weight/time measure used to express the amount of elements or compounds in water, such as carbon, oxygen, nitrogen and phosphorous, which are essential as raw materials for organism growth.

OFF-ROAD VEHICLE (ORV). Any motorized tract or wheeled vehicle designed for cross-country travel over any type of natural terrain.

OPPORTUNITY COST OF CAPITAL. The most favorable economic return that capital could accrue if it were invested in something other than the ranch operation.

"PAPER CHANGE" IN PERMIT VALUE. The change in permit value caused by an increase or decrease in the authorized use of BLM AUMs with no real increase or decrease in the actual number of AUMs being grazed by livestock.

PARENT MATERIAL. The unconsolidated and more or less chemically weathered mineral or organic matter from which the horizons of soils are developed by natural processes.

PEAK DISCHARGE. The highest stage or channel flow attained by a flood, usually expressed as the volume of water in cubic feet passing a given point in a one second time period, hence, cubic feet/second.

PEDESTALING. A phenomenon of erosion where plants or rocks are left standing on pedestals of soil. Pedestals are formed because a rock or plant has protected the soil underneath from wind and water erosion.

PERCENT OPTIMUM COVER. That percent of soil stabilizing cover consisting of vegetation, rocks, logs, etc.

PERCENTAGE OF USE. Grazing use of current vegetation growth, usually expressed as a percentage of weight removed.

PERENNIAL (PERMANENT) STREAM. A stream which flows nine or more months out of a year.

PERMEABILITY. The ease with which gases, liquids or plant roots pass through a layer of soil. Accepted as a measure of this property is the rate at which soil transmits water while saturated, and may imply how well water passes through the least permeable soil layer.

pH. The degree of acidity or alkalinity of a soil.

PERMIT (GRAZING). An authorization that permits the grazing of a specified number and kind of livestock on a designated area of public lands for a period of time, under authority of the Taylor Grazing Act.

PERMIT VALUE. The market value of a BLM grazing permit which is often included in the overall market value of the ranch.

PLANNING AREA ANALYSIS (PAA). The PAA analyzes present and future public demand for lands, renewable and nonrenewable resources. Based on data in the URA, the socio-economic profile and other information from the region, the PAA shows the significance of the land uses within a planning area to users and operators, to the community and to the region.

PLANT SUCCESSION. The process of vegetative development whereby an area becomes successively occupied by different plant communities of higher ecological orders.

PROPER USE. The degree and time of use of the current year's plant growth which, if continued, will either maintain or improve the range condition consistent with conservation of other natural resources.

PROPER USE FACTOR. The degree of use a kind of grazing animal will make of a particular plant when the range is properly grazed.

PUBLIC LANDS. Any land and interest in land (outside of Alaksa) owned by the United States and administered by the Secretary of the Interior through the Bureau of Land Management.

PUBLIC PARTICIPATION. Part of BLM's planning system that provides the opportunity for citizens as individuals or groups to express local, regional, and national perspectives and concerns in the rule making, decision making, inventory and planning processes for public lands. This includes public meetings, hearings, or advisory boards or panels that may review resource management proposals and offer suggestions or criticisms for the various alternatives considered.

RANCH DEPENDENCY. As used in this EIS, the amount of public grazing divided by the total grazing requirements of a ranch operation.

RANGE CONDITION. The present state of vegetation of a range site in relation to the climax plant community of that site. It is an expression of the relative degree to which the kinds, proportions and amounts of plants in a plant community resemble that of the climax plant community for that site. Range condition is basically an ecological rating of the plant community. Air-dry weight is the unit of measure used in comparing the composition and production of the present plant community with that of the climax community.

RANGE DEVELOPMENT. A structure, excavation, treatment or development to rehabilitate, protect or improve public lands to advance range betterment. "Range Development" is synomymous with "Range Development."

RANGE FACILITIES. Any structure or excavation such as water sources, oilers, etc. designed to facilitate range management.

RANGE IMPROVEMENT. Any of a number of facilities or land (e.g. fences, water developments, reseeding etc.) to increase range production and improve the utilization of the range by grazing animals.

RANGE SEEDING. The process of establishing vegetation by mechanical dissemination of seed.

RANGE SITE. A distinctive kind of rangeland that differs from other kinds of rangeland in its ability to produce a characteristic natural plant community. A range site is the product of all the environmental factors responsible for its development. It is capable of supporting a native plant community typified by an association of species that differs from that of other range sites in the kind or proportion of species or in total production.

RANGE TREND. The direction of change in range condition.

RECREATIONAL OPPORTUNITY. Those outdoor recreation activities which offer satisfaction in a particular physical, social and management setting. In the Big Dry EIS area, these activities are primarily hunting, fishing, wildlife viewing, picnicking and, in some areas, boating and camping.

REPRESENTATIVE RANCH BUDGET. A schedule of average costs, receipts and income for a typical ranch of a given size and type.

RESIDUAL GROUND COVER. That portion of the total vegetative ground cover that remains after the livestock grazing season.

REST ROTATION GRAZING. An intensive system of management where grazing is deferred on various parts of the range during succeeding years, allowing the deferred part complete rest for one year. Two or more units are required. Control by fencing is usually necessary on cattle range but may be obtained by herding on sheep ranges.

RIPARIAN AREA. A specialized form of wetland with vegetation that requires large amounts of free or unbound water, usually associated with wet meadows, subirrigated or saline lowland range sites.

RIPPING. The mechanical penetration and shearing of soils to break hardpan layers to facilitate penetration of plant roots, water, organic matter, and nutrients. Used where native grasses of a rhizomatous nature can spread into the ripped soil.

RUNOFF. The water that flows on the land surface from an area in response to rainfall or snowmelt. As used in this EIS, runoff from an area becomes streamflow when it reaches a channel.

SALINE SEEP. Areas of recently developed salinity in soils that are non-irrigated but are wet some or all of the time and often have white salt crusts. Grass production on saline seeps is reduced or eliminated.

SALINE SOIL. A non-sodic soil containing sufficient soluble salt to impair its productivity. The electric conductivity of the saturation extract is more than two michrohms per centimeter at 25° C.

SALINITY. A measure of the mineral substances disolved in water.

SANDY. A soil containing a large amount of sand. Textural classes are sands and loamy sands, with less than 18 percent clay.

SCALPING. Removing 10 to 25 inch wide strips of native vegetation and leaving undisturbed strips between. This mechanical treatment speeds range improvement by retaining rain, water and snowmelt and by reducing competition to desirable species from a dense stand of less desirable vegetation.

SCOPING (PUBLIC). The process for determining the scope of issues addressed and identification of significant issues related to a proposed action. The participation is invited of affected federal, state, and local agencies and affected Indian tribes and other interested persons to participate in this process.

SEASON OF USE. The time of livestock grazing on a range area.

SEASONAL GRAZING. Grazing use throughout a specific season.

SEDIMENT. Soil, rock particles and organic or other debris carried from one place to another by wind, water or gravity.

SEDIMENTATION. The action or process of deposition of material borne by water, wind or glacier.

SEDIMENTARY ROCK. A rock formed from materials deposited from suspension or precipitated from solution and usually being more or less consolidated. The principal sedimentary rocks are sandstone, shales and limestones.

SEDIMENT YIELD. The total amount of sediment given up by a watershed over a specified time period, usually a year. Ordinarily it is expressed as tons, acre feet or cubic yards of sediment per unit of drainage area per year.

SHEET EROSION. The detachment of soil material from the land surface by raindrop impact and its subsequent removal removal by runoff.

SHRUB. A low woody plant, usually with several stems, that may provide food and/or cover for animals.

SODIC SOIL. A soil containing sufficient exchangeable sodium to interfere with the growth of most crop plants. A soil in which the sodium absorption ration of the saturation extract is 15 or more.

SOIL. The unconsolidated mineral material on the immediate surface of the earth that serves as a natural medium for the growth of land plants.

SOIL ASSOCIATION. A mapping unit used on general soil maps in which two or more defined series occuring together in a characteristic pattern are combined. This could be because the scale of the map or the purpose for which it is being made does not require delineation of the individual series.

SOIL LOSS. The detachment of material from the land surface by raindrop impact and its subsequent removal by prechannel or overland flow. Synonymous with "Sheet Erosion."

SOIL MAP. A map showing the distribution of soil series or other soil mapping units in relation to the prominent physical and cultural features of the earth's surface.

SOIL MOISTURE. Water held in the root zone by capillary action. Part of the soil moisture is available to plants, part is held too tightly by capillary or molecular forces to be removed by plants.

SOIL SERIES. The basic unit of soil classification, being a subdivision of a family and consisting of soils which are essentially alike in all major profile characteristics except in the texture of the "A" horizon (or surface layer).

SOIL SURFACE FACTOR (SSF). An expression of current erosion activity. Seven categories of surface features are considered in the examination of the area with both wind and water being considered for each category. The categories are: soil movement, surface litter, surface rock, pedestaling, rills, flow patterns and gullies. Numerical values are assigned to each category, and these are totaled to determine the SSF. This value determines the erosion condition class of the area. See also "Erosion Condition Classes."

SOIL TEXTURE OR SOIL TEXTURAL CLASSES. The relative proportions of the various soil separates (sand, silt, and clay) in a soil material.

SPECIES OF SPECIAL INTEREST OR CONCERN. Species not yet listed as "endangered or threatened" but whose status is being reviewed because of their widely dispersed populations or their restricted ranges. A species whose population is particulrly sensitive to external disturbance.

STREAMBANK (and CHANNEL) EROSION. This is the removal and transport of material by concentrated flows.

STREAM COURSE. See "Channel"

SURFACE SOIL OR SURFACE LAYER. The upper most part of the soil, ordinarily moved in tillage, or its equivalent in uncultivated soils and ranging in thickness from 4 to 8 inches. Frequently designated as the "Plow layer," the AP layer or the Ap horizon.

SUSTAINED YIELD. The achievement and maintenance of a high level annual or periodic yield of the various renewable resources of public lands consistent with multiple use.

THREATENED SPECIES. A species that the Secretary of Interior has determined to be likely to become endangered within the forseeable future throughout all or most of its range. See also "Endangered or Threatened Species."

TOPOGRAPHY. The exact physical features and configuration of a place or region; the detailed and accurate description of the landforms of a place or region.

TOTAL DISSOLVED SOLIDS. The dry weight of dissolved material, organic and inorganic, contained in water.

TRESPASS. The grazing of livestock on public lands without proper authority.

TURBIDITY. An interference to the passage of light through water due to insoluble particles of soil, organics, micro-organisms and other materials.

UNDERLYING MATERIAL. The weathered parent material (See "Parent Material")

UNIT RESOURCE ANALYSIS (URA). A comprehensive display of physical resource data and an analysis of the current use, production, condition and trend of the resources and the potentials and opportunities within a planning unit, including a profile of ecological values.

VEGETATION (GROUND) COVER. The percent of land surface covered by all living vegetation (and remnant vegetation yet to decompose) within 20 feet of the ground.

VESICULAR. Soil pores are spherical or elliptical in shape. Pores of this type are enclosed by unaggregated soil, often in the form of a surface crust.

VISUAL RESOURCE(S). The land, water, vegetation and animals that comprise the scenery of an area.

VISUAL RESOURCE MANAGEMENT (VRM). The planning, design and implementation of management objectives to provide acceptable levels of visual impacts for all BLM resource management activities.

VISUAL RESOURCE MANAGEMENT CLASS. Classification of landscapes according to the kind and degree of visual change that is acceptable within that characteristic landscape.

WATER INFLUENCE ZONE. That land within and adjacent to a stream channel which is within the perimeter of the maximum probable flood.

WATER QUALITY. The chemical, physical and biological characteristics of water with respect to its suitability for a particular use.

WATERSHED. All lands which are enclosed by a continuous hydrologic drainage divide and lie upslope from a specified point on a stream.

WATERSHED COVER. The material (vegetation, litter, rock) covering the soil and providing protection from, or resistance to, the impact of raindrops and the energy of overland flow, and expressed in percent of the area covered.

WATER SPREADER. A terrace, dike or other structure intended to distribute surface water runoff and increase the area of infiltration.

WATER YIELD. The quantity of water derived from a unit area of watershed.

WETLANDS. Permanently wet or intermittently flooded areas where the water table (fresh, saline or brackish) is at, near or above the soil surface for extneded intervals, where hydric wet soil conditions are normally exhibited and where water depths generally do not exceed two meters.

WILDERNESS STUDY AREA. A roadless area determined to have wilderness characteristics. Study areas will be subjected to interdisiplinary analysis and public comment to determine wilderness suitability. Suitable areas will be recommended to the President and Congress for wilderness designation.

WOLF PLANT. A plant that, though the species is considered palatable, is not grazed by livestock. The term "wolfy" is often used to describe this condition which is common on underutilized crested wheatgrass seedings.

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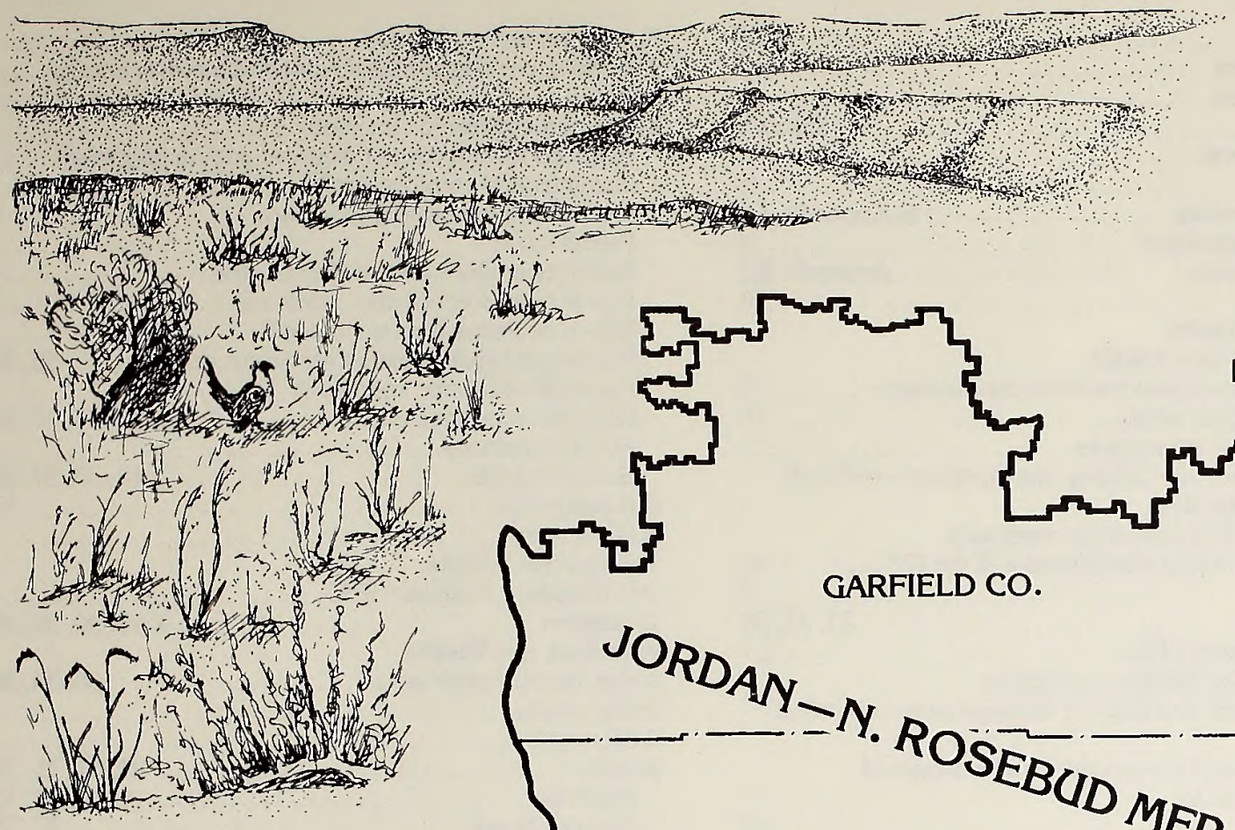
LOCATION OF BIG DRY EIS AREA



RICHLAND CO.

MC CONE CO.

REDWATER MFP

DAWSON CO.

Glendive

GARFIELD CO.

PRAIRIE CO.

JORDAN—N. ROSEBUD MFP

WIBAUX CO.

NEW PRAIRIE MFP

ROSEBUD CO.

CUSTER CO.

Miles City

FALLON CO

MONTANA

LEGEND

— — — Management Framework Plan

—·— County Boundaries

N

This map supplement displays resources and land ownership in the Big Dry Environmental Impact Statement (EIS) area, of which 1.18 million acres are managed by the Bureau of Land Management (BLM).

An overlay depicting grazing allotment numbers is included in the map pocket inside the back cover.

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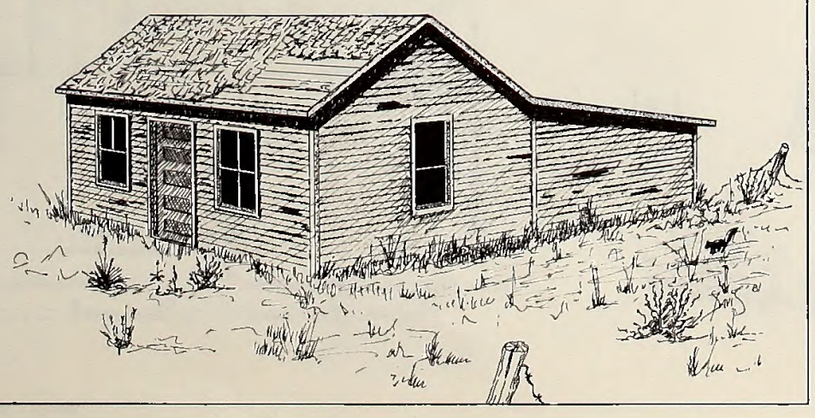
Allotment Overlay (map pocket)

LAND STATUS



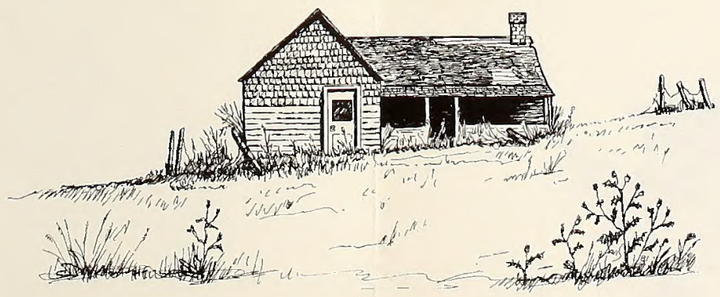
BIG DRY EIS

Vegetation Allocation

LAND STATUS

LEGEND

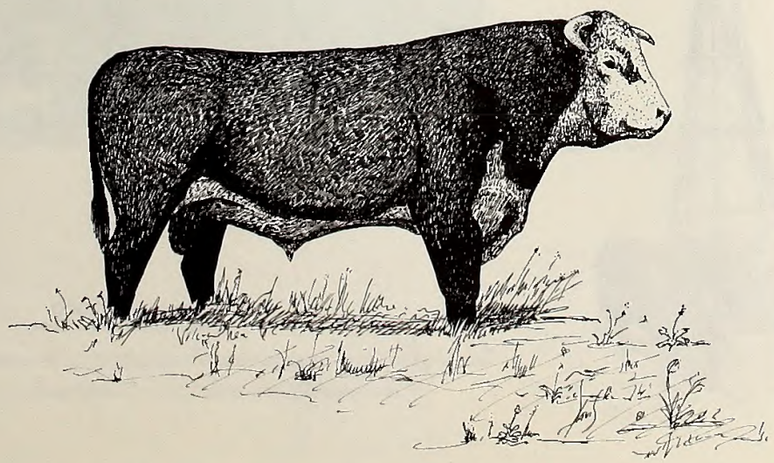
- Area Covered by the Missouri Breaks EIS
- Charles M. Russell National Wildlife Refuge
- Federal Land
- State Land
- Wilderness Study Areas
  (due to scale, areas are only approximations)



Scale 1:500,000
1 inch equals approximately 8 miles

Source: BLM, 1967.

ALLOTMENTS



BIG DRY EIS

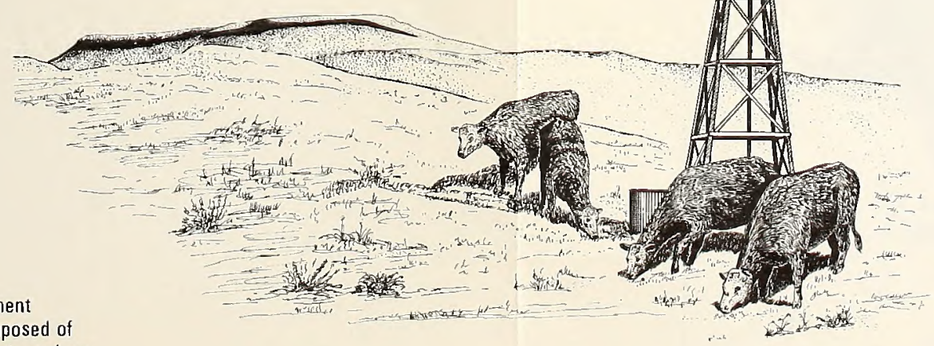
Vegetation Allocation

ALLOTMENTS

LEGEND

- Area Covered by the Missouri Breaks EIS
- Charles M. Russell National Wildlife Refuge
- Existing AMPs
- Proposed AMPs
- Non AMPs
- Unleased AMPs
- AMP's Covered In Missouri Breaks EIS
- Private Land

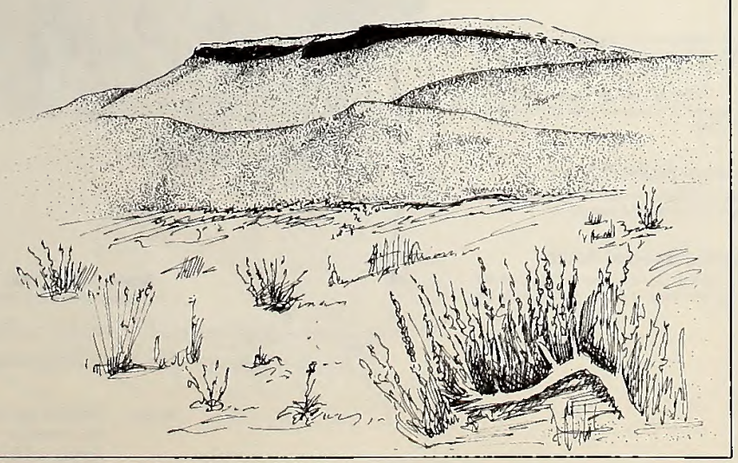
NOTE: Shown is a graphic description of allotment boundaries. Allotment numbers are composed of four digits (example — 2609). Allotment numbers are located on overlay in back pocket.



Scale 1:500,000
1 inch equals approximately 8 miles

Source: Based on URA data — Redwater, New Prairie and Jordan-North Rosebud Resource Areas

SOILS



BIG DRY EIS

Vegetation Allocation

SOILS

SUBGROUPS AND ECOLOGICAL RANGE SITES

LEGEND

Area Covered by the Missouri Breaks EIS

Charles M. Russell National Wildlife Refuge

Soils of the Floodplains, Fans and Low Terraces

1 ENTISOLS--ARIDISOLS--INCEPTISOLS--MOLLISOLS: nearly level to strongly sloping (0-15% slopes) clayey, loamy and sandy soils on floodplains and low terraces.

Soils of the Glaciated Till Plains

5 MOLLISOLS—ENTISOLS: undulating to strongly rolling (2-15% slopes) loamy soils on glacial till plains.

6 ENTISOLS—MOLLISOLS: strongly rolling to steep (8-45% slopes) loamy soils on dissected glacial till plains.

10 MOLLISOLS—ARIDISOLS: nearly level to hilly (0-25% slopes) clayey and loamy soils on dissected glacial till plains.

Soils of Fans, Benches and Terraces

2 MOLLISOLS: nearly level to strongly rolling (0-15% slopes) loamy and sandy soils on fans, benches and terraces.

7 MOLLISOLS—ARIDISOLS: nearly level to steep (0-45% slopes) loamy and sandy soils on fans, benches and terraces.

11 ARIDISOLS—MOLLISOLS: nearly level to steep (0-45% slopes) clayey and loamy soils on fans, benches and terraces.

Soils of Dissected Sedimentary Bedrock Plains and Hills

3 ENTISOLS—INCEPTISOLS—MOLLISOLS: strongly sloping to steep (8-45% slopes) loamy and sandy soils on sedimentary bedrock plains and hills.

4 MOLLISOLS—ENTISOLS: nearly level to strongly sloping (0-15% slopes) clayey, loamy and sandy soils on sedimentary bedrock plains.

8 ENTISOLS—MOLLISOLS: strongly sloping to steep (8-45% slopes) clayey and sandy soils on dissected sedimentary bedrock plains and hills.

9 ENTISOLS--ARIDISOLS: strongly sloping to steep (8-45% slopes) clayey, loamy and sandy soils on dissected sedimentary bedrock plains and hills.

12 ENTISOLS—ARIDISOLS: strongly sloping to steep (8-45% slopes) clayey, loamy and sandy soils on dissected sedimentary bedrock plains and hills.

13 ARIDISOLS—ENTISOLS: nearly level to moderately sloping (0-25% slopes) clayey, loamy and sandy soils on sedimentary bedrock plains.

Soils of Dissected Shale Plains

14 ENTISOLS—ARIDISOLS: strongly sloping to steep (8-45% slopes) clayey soils on dissected shale plains.

Soils of Dissected Badland Areas

15 BADLANDS—ENTISOLS: steep and very steep (25-45% slopes) clayey and loamy soils of highly dissected river breaks.

Scale 1:500,000
1 inch equals approximately 8 miles

10 0 10 20 30 40 Miles

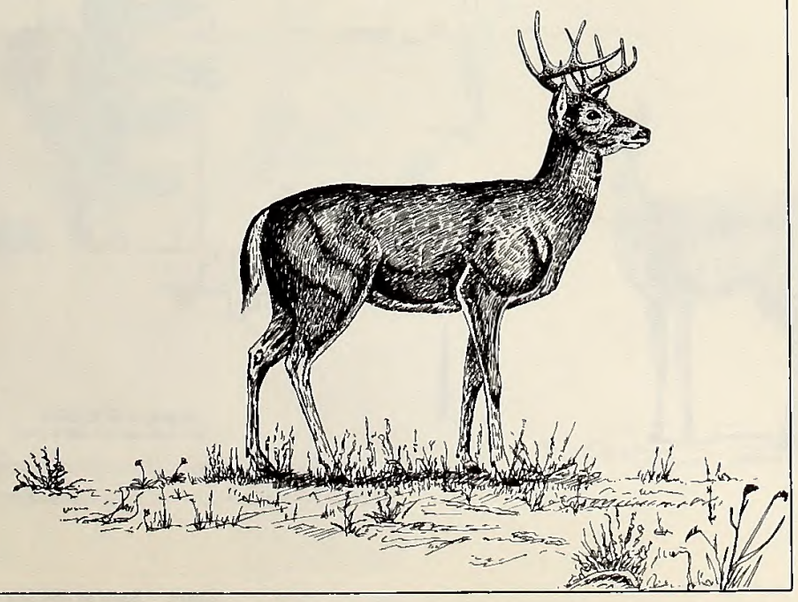
10 0 10 20 30 40 50 Kilometers

Source: Modified from the general soils map prepared by the United States Department of Agriculture, Soil Conservation Service and Montana Agricultural Experiment Station, Montana State University, October 1978.

107° 106° 105° 104° 48° 47° 46°

NORTH DAKOTA

WILDLIFE HABITAT



BIG DRY EIS

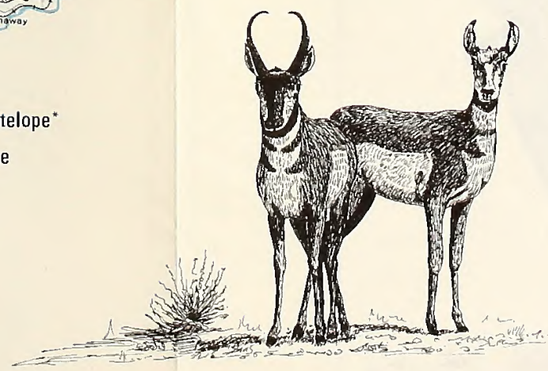
Vegetation Allocation

WILDLIFE HABITAT

LEGEND

- Area Covered by the Missouri Breaks EIS
- Charles M. Russell National Wildlife Refuge
- Antelope*
- White-tailed Deer
- Mule Deer
- Sage Grouse
- Mule Deer/White-tailed Deer
- Mule Deer/Antelope*
- Mule Deer/White-tailed Deer/Antelope*
- Mule Deer/Antelope*/Sage Grouse
- Mule Deer/Sage Grouse
- White-tailed Deer/Antelope*
- Antelope*/Sage Grouse

*Crucial Winter Habitat



Scale 1:500,000
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10 0 10 20 30 40 Miles

10 0 10 20 30 40 50 Kilometers

Source: Based on URA data — Redwater, New Prairie and Jordan-North Rosebud Resource Areas.

107° 106° 105° 104° 48° 47° 46°